

THE JOURNAL OF  
**MEDICAL  
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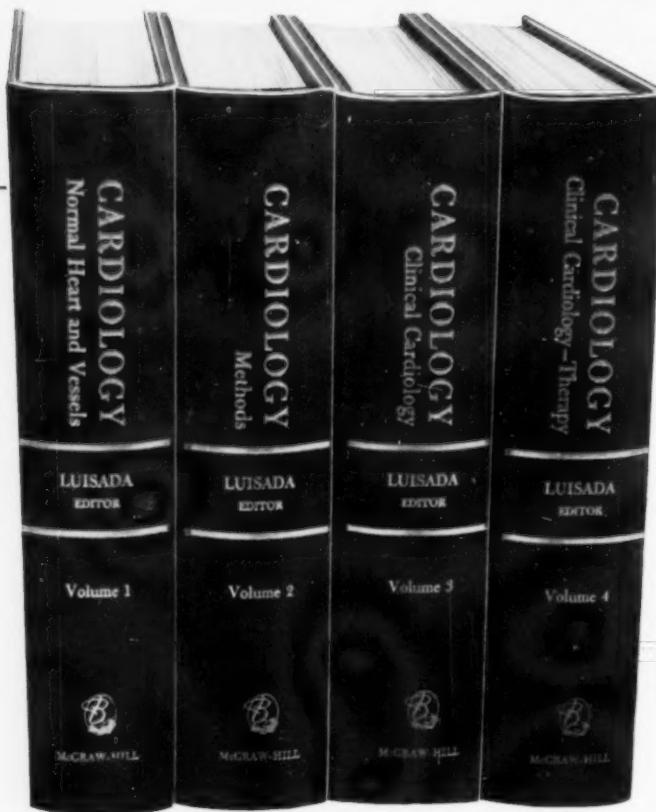
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*The Journal of Medical Education* serves as an international medium for the exchange of ideas in medical education, as well as a means of communicating the policies, programs, and problems of the Association. The Editorial Board welcomes the submission of manuscripts concerned with the broad field of medical education; this includes preparation for medical education; the medical school experience; intern and resident education; graduate and postgraduate medical education. The Editorial Board recognizes that medical education includes the activities of faculty, students, administrators, and those of the practicing profession who also teach and learn. Thus, it invites communications from any of these sources.

Manuscripts should be submitted in duplicate. All manuscripts are reviewed by the Editorial Board before acceptance for publication. All copy, including footnotes, tables, and legends, should be typed double-spaced. Each diagram or graph or photograph should have a brief legend. Each table should be typed on a separate sheet of paper. References should refer to published material only, must be submitted in alphabetical order, and should include, in order: author, title, journal abbreviation (*Quarterly Cumulative Index Medicus* form), volume number, page, and year; book references should also include editors, edition, publisher, and place of publication.

Galley proofs will be mailed to authors for correction before publication and should be returned within 48 hours after receipt.

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*Medical Education Forum* includes editorials, letters, comments, criticisms, and excerpts from important addresses.

*News from the Medical Schools:* Material for this section should be transmitted to the News Editor, Miss Neva Resek, 2530 Ridge Avenue, Evanston, Illinois. Announcements of major faculty and administrative appointments, news of distinguished visitors and significant educational developments will be included. It is not possible to publish notices on grants-in-aid for scientific research.

*Items of Current Interest:* Audio-visual news and notices from national and federal agencies appear in this section.

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Address all correspondence concerning subscriptions, reprints, changes of address, and back numbers to the University of Chicago Press, 5750 Ellis Avenue, Chicago 37, Illinois. All changes of address should provide both the old and the new address.

Address all correspondence concerning news, announcements, and personnel exchange to the office of the Association of American Medical Colleges, 90 Miss Neva Resek, 2530 Ridge Avenue, Evanston, Illinois; address all correspondence concerning advertising to Miss Helen Claire Herman, 2530 Ridge Avenue, Evanston, Illinois.

<p>HOPPS'</p> <p><b>PRINCIPLES OF PATHOLOGY</b></p> <p>(New Book—June 1959)</p>	<p><b>By Howard C. Hopps, M.D.</b> University of Texas, Medical Branch, Galveston</p> <p>The purpose of this text is to establish for the student a basic concept of disease and a broad understanding of how disease becomes established, how and why it produces its effects. The presentation of principles establishes a firm foundation for later assimilation of specific facts. More than 600 illustrations are immediately adjacent to pertinent text matter on an 8" x 10" page and an appendix gives additional tabular data useful to the student.</p> <p>330 Pages • 613 Illus. • June 1959 • \$6.95</p>
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<p><b>BASIC CLINICAL PARASITOLOGY</b></p> <p>(New Book—Sept. 1958)</p>	<p><b>By David L. Belding, M.D.</b></p> <p>This new title is a practical condensation of the author's definitive TEXTBOOK OF CLINICAL PARASITOLOGY. Following introductory chapters on general parasitology, the author covers the protozoa in 3 chapters, nemathelminthes in 3 chapters, cestoidea in 3 chapters, the trematoda in 3 chapters and arthropoda in 4 chapters. A concluding section covers technical methods of diagnosis of parasitic diseases and methods of treatment.</p> <p>544 Pages • Illus. • \$9.00</p>
<p>FOLEY &amp; WRIGHT'S</p> <p><b>COLOR ATLAS AND MANAGEMENT OF VASCULAR DISEASE</b></p> <p>(New Book—Aug. 1959)</p>	<p><b>By William T. Foley, M.D. and Irving S. Wright, M.D.</b></p> <p>Vascular Disease Clinic, New York Hospital</p> <p>194 illustrations, mostly four-color enlargements of transparencies, illustrate 94 cases of vascular disease. Text includes brief case histories, discussion of type of case and explanations of the authors' points of view on diagnosis, pathogenesis and conservative treatment. These selected cases cover arterial and venous diseases; lymphedema; vasospasm; aneurism; minute vessel diseases; and blood vessel tumors. Index and references included.</p> <p>225 Pages • 194 Illus. Aug. 1959 • \$18.00</p>

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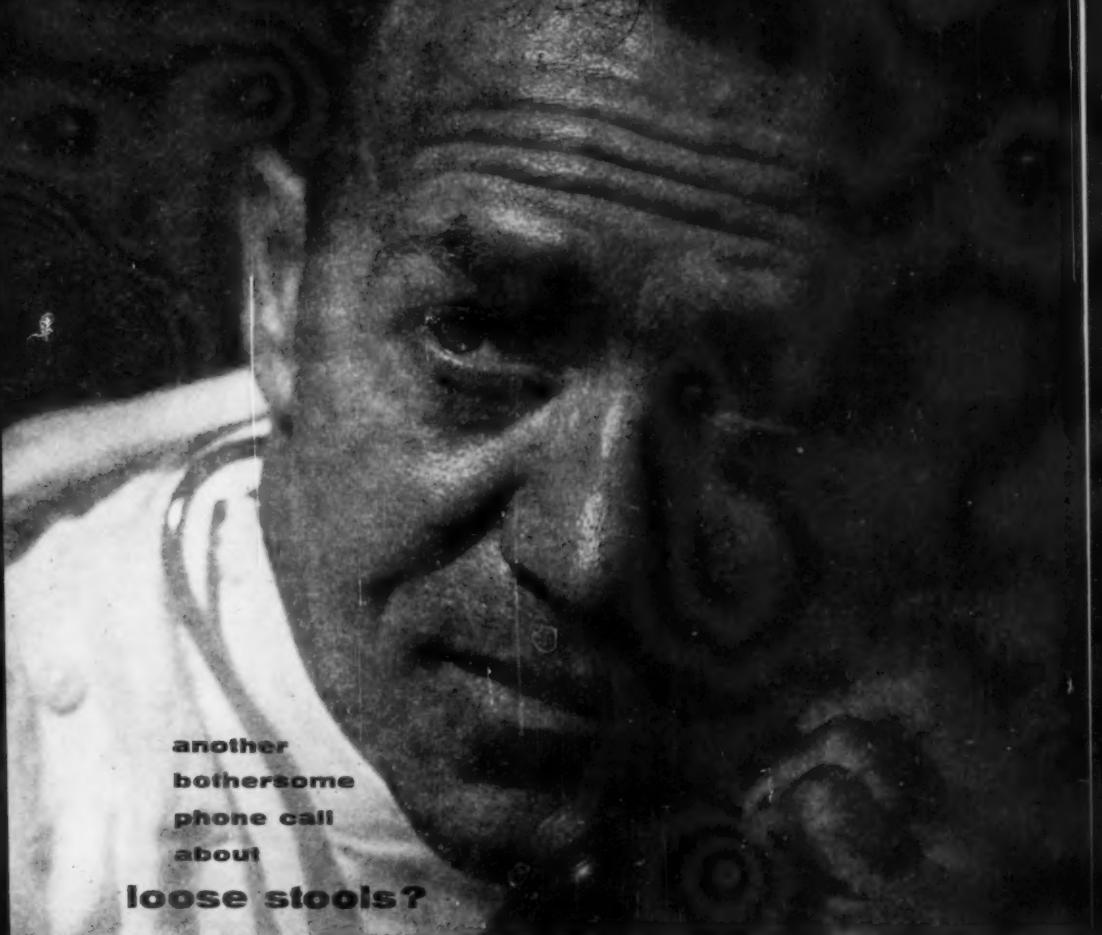
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7 mo.	19	0
8 mo.	11	0
9 mo.	10	0
10 mo.	8	0
11 mo.	11	0
12 mo.	10	0
	190	3 (1.6%)

<sup>1</sup>Exclusive of infants admitted with infectious diarrhea

<sup>2</sup>1. Frost, L. H., and Jackson, R. L.: *J. Pediat.* 39:585-592 (Nov.) 1951.  
2. Menrickson, W. E.: *GP B*: 51-56 (Oct.) 1953.

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## Calendar of Meetings

### ASSOCIATION OF AMERICAN MEDICAL COLLEGES

#### 70th Annual Meeting, November 2-4 Edgewater Beach Hotel, Chicago, Ill.

##### SEPTEMBER

AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS, The Homestead, Hot Springs, Va., Sept. 10-12. Dr. E. Stewart Taylor, 4200 E. Ninth Ave., Denver 20, Secretary.

AMERICAN ASSOCIATION FOR THE SURGERY OF TRAUMA, Mount Washington Hotel, Bretton Woods, N.H., Sept. 24-26. Dr. William T. Fitts, Jr., 3400 Spruce St., Philadelphia 4, Secretary.

AMERICAN COLLEGE OF GASTROENTEROLOGY, Biltmore Hotel, Los Angeles, Sept. 19-23. Mr. Daniel Weiss, 33 W. 60th St., New York 23, N.Y., Executive Director.

AMERICAN COLLEGE OF SURGEONS, The Traymore Hotel, Atlantic City, N.J., Sept. 28-Oct. 2. Dr. Paul R. Hawley, 40 E. Erie St., Chicago 11, Director.

AMERICAN ROENTGEN RAY SOCIETY, The Netherland Hilton Hotel, Cincinnati, September 22-25. Dr. C. Allen Good, Mayo Clinic, Rochester, Minn., Secretary.

CENTRAL ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS, Drake Hotel, Chicago, Sept. 24-26. Dr. Edwin J. DeCosta, 104 S. Michigan Ave., Chicago 3, Secretary.

MEDICAL PROGRESS ASSEMBLY, Tutwiler Hotel, Birmingham, Ala., Sept. 13-15. Dr. Herbert H. Thomas, 920 S. 19th St., Birmingham, Ala., Chairman, Publicity Committee.

MID-CONTINENT PSYCHIATRIC ASSOCIATION, Holiday Inn Motor Hotel, St. Louis County, Mo., Sept. 18-20. Dr. W. Payton Kolb, Baptist Medical Arts Bldg., Little Rock, Ark., Secretary.

NORTH AMERICAN FEDERATION, INTERNATIONAL COLLEGE OF SURGEONS, Chicago, Sept. 13-17. For information write: The Secretariat, 1516 Lake Shore Dr., Chicago 10.

UNITED STATES SECTION, INTERNATIONAL COLLEGE OF SURGEONS, Palmer House, Chicago, Sept. 13-17. Dr. Ross T. McIntyre, 1516 Lake Shore Dr., Chicago 10, Executive Secretary.

##### OCTOBER

ACADEMY OF PSYCHOSOMATIC MEDICINE, Sheraton-Cleveland Hotel, Cleveland, Oct. 15-17. For information write: Dr. Bertram B. Moss, Suite 1035, 55 E. Washington St., Chicago 2, Secretary.

AMERICAN ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY, The Palmer House, Chicago, Oct. 11-16. Dr. William L. Benedict, 15 Second St., S.W., Rochester, Minn., Executive Secretary.

AMERICAN ACADEMY OF PEDIATRICS, The Palmer House, Chicago, Oct. 5-8. Dr. E. H. Christopherson, 1801 Hinman Ave., Evanston, Ill., Executive Secretary.

AMERICAN ASSOCIATION OF MEDICAL RECORD LIBRARIANS, Radisson Hotel, Minneapolis, Oct. 12-15. Miss Margaret G. Scully, 510 N. Dearborn St., Chicago 10, Director.

AMERICAN COLLEGE OF CARDIOLOGY, Benjamin Franklin Hotel, Philadelphia, Oct. 23-25. Dr. Philip Reichert, Empire State Bldg., New York 1, Executive Director.

AMERICAN COLLEGE OF CHEST PHYSICIANS, 25th Anniversary Homecoming Meeting, Albuquerque, N.M., Oct. 14-17. Mr. Murray Kornfeld, 112 E. Chestnut St., Chicago 11, Executive Director.

AMERICAN COLLEGE OF PREVENTIVE MEDICINE, Hotel Ambassador, Atlantic City, N.J., Oct. 21-22. Dr. John J. Wright, P.O. Box 1267, Chapel Hill, N.C., Secretary-Treasurer.

AMERICAN HEART ASSOCIATION, Trade and Convention Center, Philadelphia, Oct. 23-27. Mr. William F. McGlone, 44 E. 23rd St., New York 10, Secretary.

AMERICAN MEDICAL WRITERS' ASSOCIATION, Chase Hotel,

St. Louis, Oct. 2-3. Dr. Harold Swanberg, 510 Maine St., Quincy, Ill., Secretary.

AMERICAN OTORHINOLOGIC SOCIETY FOR PLASTIC SURGERY, INC., Conrad Hilton Hotel, Chicago, Oct. 11. Dr. Joseph G. Gilbert, 75 Barberry Lane, Roslyn Heights, N.Y., Secretary.

AMERICAN PSYCHIATRIC ASSOCIATION, Detroit Divisional Meeting, Hotel Statler, Detroit, Oct. 29-31. Dr. Benjamin Jeffries, 16321 Mack Ave., Detroit 24, Co-Chairman, Planning Committee.

AMERICAN PUBLIC HEALTH ASSOCIATION, Convention Hall, Atlantic City, N.J., Oct. 19-23. Dr. Berwyn F. Mattison, 1790 Broadway, New York 19, N.Y., Executive Director.

AMERICAN SCHOOL HEALTH ASSOCIATION, Claridge Hotel, Atlantic City, N.J., Oct. 18-23. Dr. A. O. DeWeese, 515 E. Main St., Kent, Ohio, Executive Secretary.

AMERICAN SOCIETY OF ANESTHESIOLOGISTS, INC., Americana Hotel, Bal Harbor, Fla., Oct. 5-9. Mr. John W. Andes, 188 W. Randolph St., Room 1101, Chicago 1, Executive Secretary.

AMERICAN SOCIETY OF FACIAL PLASTIC SURGERY, Chicago, Oct. 15-17. Dr. Samuel M. Bloom, 123 E. 83rd St., New York 28, Secretary.

AMERICAN SOCIETY OF PLASTIC AND RECONSTRUCTIVE SURGERY, Hotel Fontainebleau, Miami Beach, Fla., Oct. 18-23. Dr. Thomas Ray Broadbent, 508 E. South Temple, Salt Lake City, General Secretary.

AMERICAN SOCIETY OF TROPICAL MEDICINE AND HYGIENE, Claypool Hotel, Indianapolis, Oct. 28-31. Dr. Kolla B. Hill, 3575 St. Gaudens Road, Miami 33, Fla., Executive Secretary.

CONGRESS OF NEUROLOGICAL SURGEONS, Americana Hotel, Miami, Fla., Oct. 28-31. Dr. Richard L. DeSauvage, Suite 101 B, 20 S. Dudley St., Memphis, Tenn., Secretary-Treasurer.

##### NOVEMBER

AMERICAN COLLEGE OF CHEST PHYSICIANS, Dallas, Texas, Nov. 29-30. Mr. Murray Kornfeld, 112 E. Chestnut St., Chicago 11, Executive Secretary.

AMERICAN MEDICAL WOMEN'S ASSOCIATION, Arlington, Hot Springs, Ark., Nov. 12-15. Mrs. Lillian T. Majally, 1790 Broadway, New York 19, Executive Secretary.

ASSOCIATION OF MILITARY SURGEONS OF THE UNITED STATES, Mayflower Hotel, Washington, D.C., Nov. 8-11. Lt. Col. George M. Beam, AUS, Ret., Suite 718, New Medical Bldg., 1726 Eye St., N.W., Washington 6, D.C., Executive Secretary.

CENTRAL SOCIETY FOR CLINICAL RESEARCH, Drake Hotel, Chicago, Nov. 6-7. Dr. Austin S. Weisberger, 2065 Adelbert Rd., Cleveland 6, Secretary.

GASTROENTEROLOGY RESEARCH GROUP, Drake Hotel, Chicago, Nov. 6. For information write Dr. Charles F. Code, Mayo Clinic, Rochester, Minn.

INTERNATIONAL COLLEGE OF SURGEONS, MID-ATLANTIC MEETING OF THE U.S. SECTION, Homestead Hotel, Hot Springs, Va., Nov. 16-18. For information, write Dr. E. G. Gill, 711 S. Jefferson St., Roanoke, Va.

INTER-SOCIETY CYTOLOGY COUNCIL, Statler Hilton Hotel, Detroit, Nov. 19-21. Dr. Paul A. Young, 1101 Beacon St., Brookline 46, Mass., Secretary-Treasurer.

INTERSTATE POSTGRADUATE MEDICAL ASSOCIATION OF NORTH AMERICA, The Palmer House, Chicago, Nov. 2-5. Mr. Roy T. Ragatz, Box 1109, Madison 1, Wis., Executive Secretary.

NATIONAL PROCTOLOGIC ASSOCIATION, Chicago, Nov. Dr. George E. Mueller, 59 E. Madison, Chicago 2, Secretary.

NATIONAL SOCIETY FOR CRIPPLED CHILDREN AND ADULTS, Palmer House, Chicago, Nov. 29-Dec. 2. Dr. Dean W. Roberts, 2023 W. Ogden Ave., Chicago 12, Executive Director.

RADIOLOGICAL SOCIETY OF NORTH AMERICA, INC., Palmer House, Chicago, Nov. 15-20. Dr. Donald S. Childs, 713 E. Genesee St., Syracuse 2, N.Y., Secretary-Treasurer.

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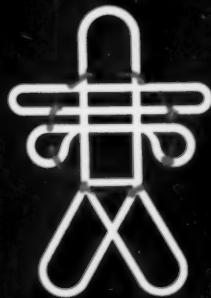
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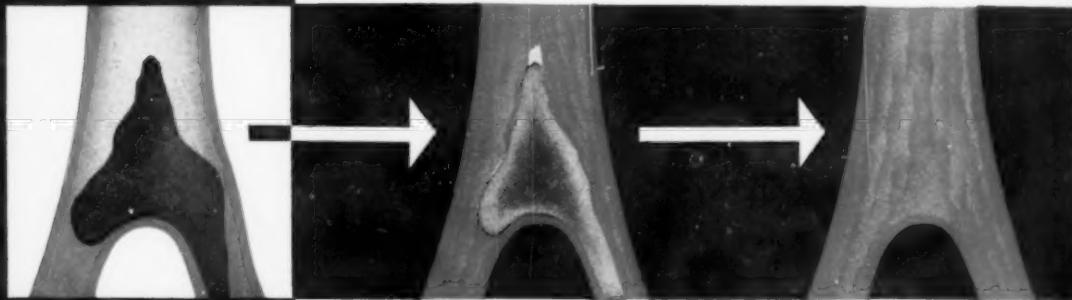


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4. Singer, H.O., and Chapple, R.V.: Clin. Med. 6:439 (March) 1958.

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\*Barrett, C. D., Jr., et al.: *J.A.M.A.* 167:1103, 1958;

*Ibid.*; *Am. J. Pub. Health* 49:644, 1959.

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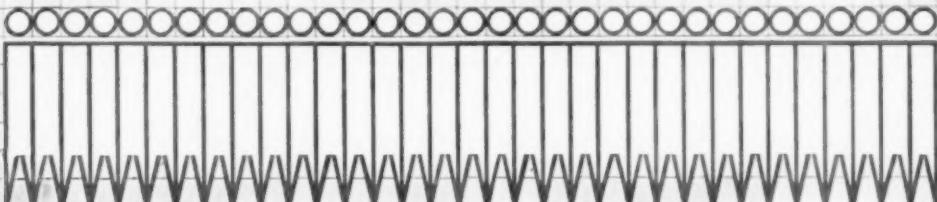
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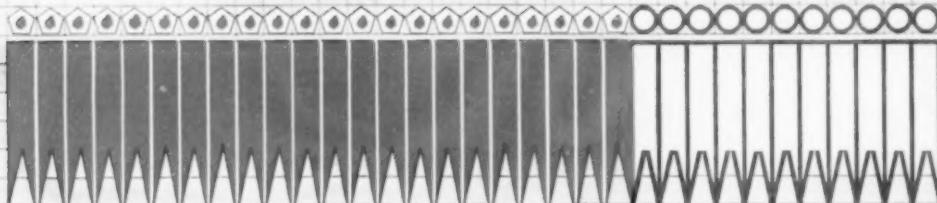
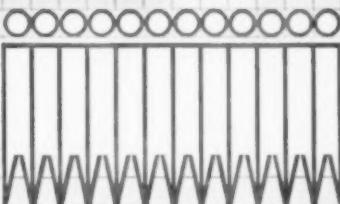
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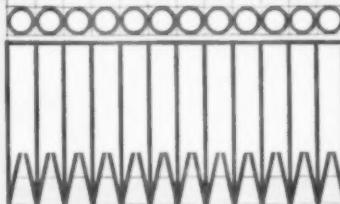
1. Boland, E. W., and Headley, N. E.: Paper read before the Am. Rheum. Assoc., San Francisco, Calif., June 21, 1958.

2. Bunim, J. J., et al.: Paper read before the Am. Rheum. Assoc., San Francisco, Calif., June 21, 1958.

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1. Case reports on file, Wyeth Laboratories. 2. Parks, R.V., and Moessner, G.F.: Dual Approach to Patient Care, Scientific Exhibit, A.A.G.P., April, 1959.

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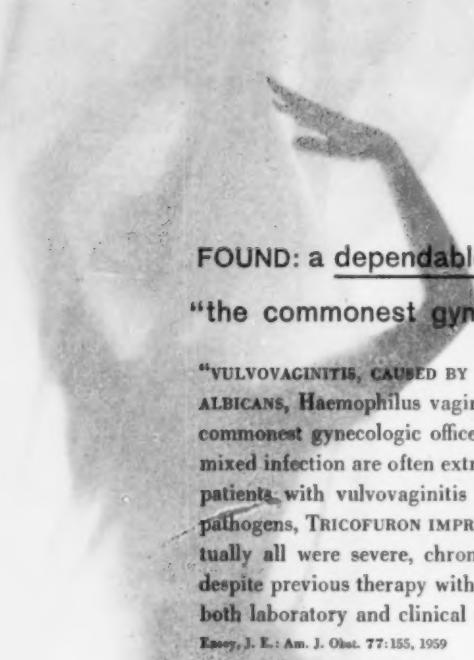
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Easey, J. E.: Am. J. Obst. 77:155, 1959

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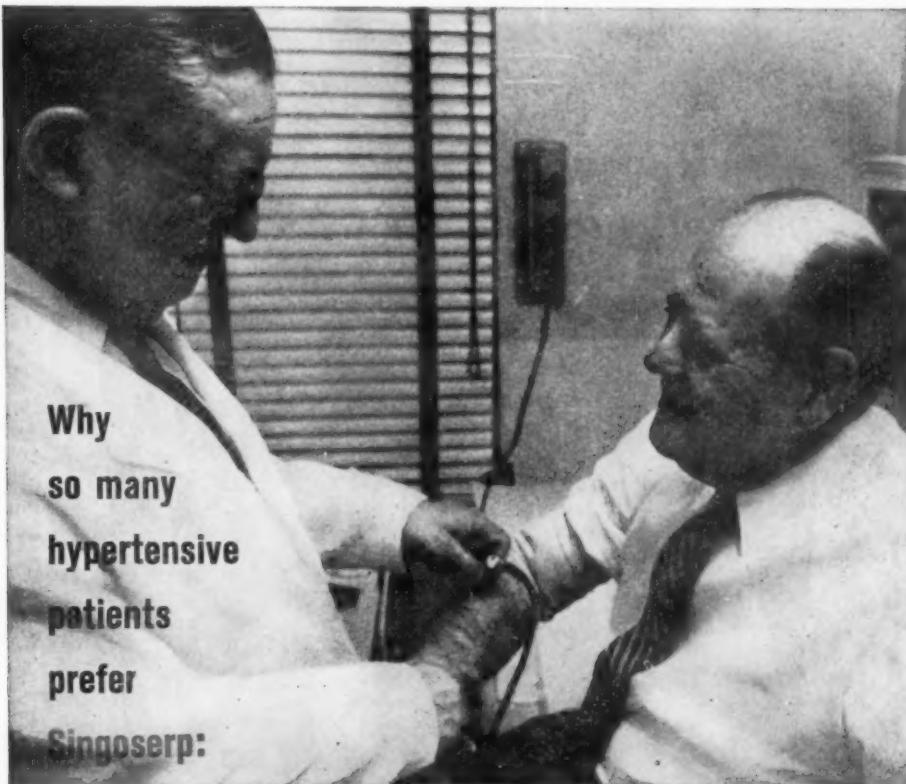
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\*Herrmann, G. R., Vogelpohl, E. B., Heitmancik, M. R., and Wright, J. C.: J.A.M.A. 169:1609 (April 4) 1959.

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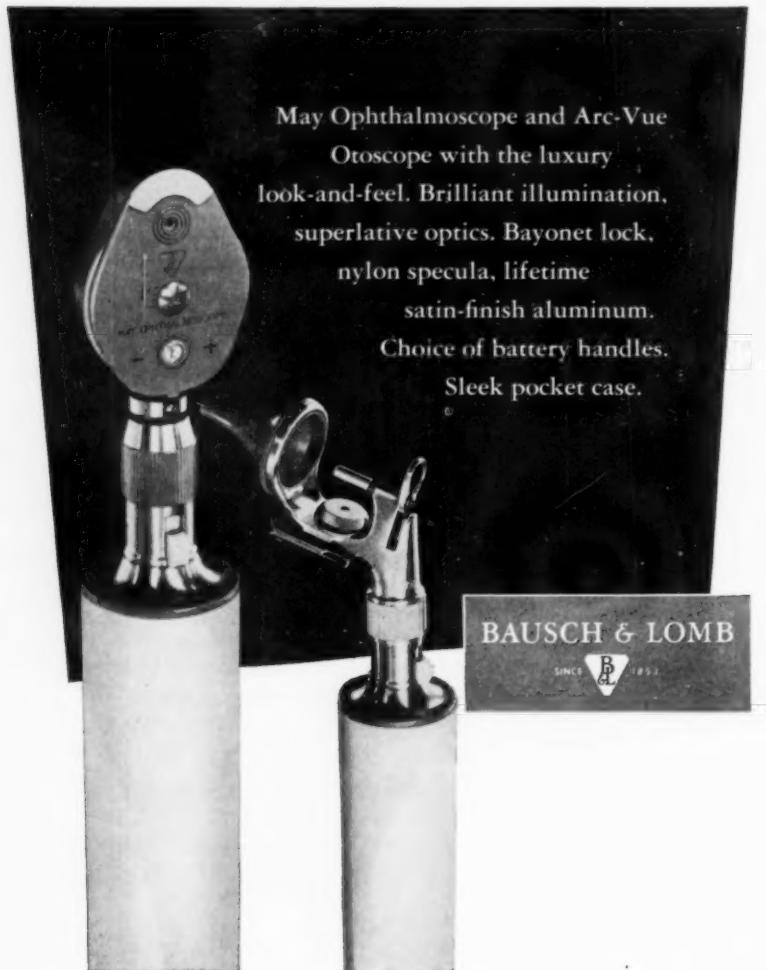
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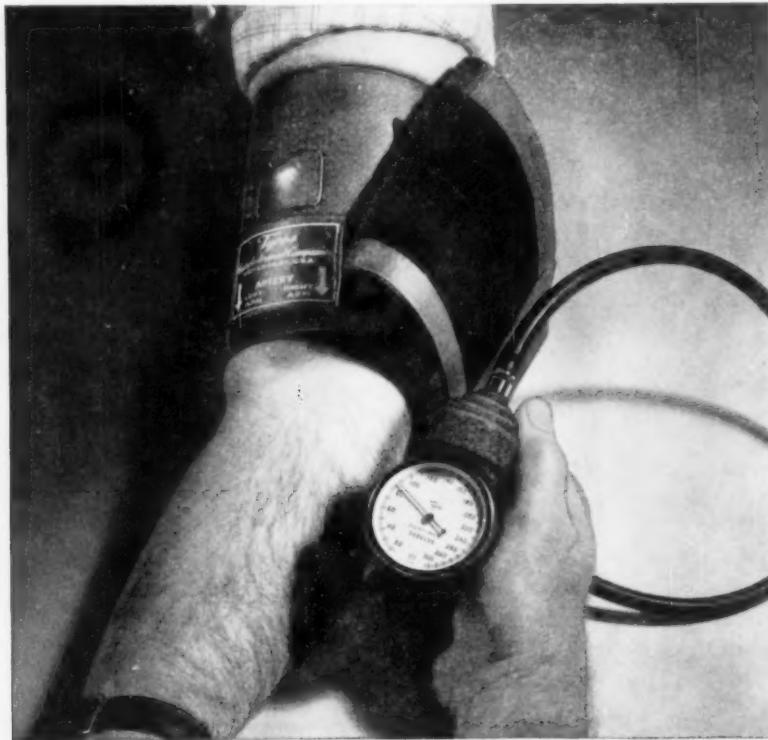
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# The Journal of MEDICAL EDUCATION

VOLUME 34 • NUMBER 9 • SEPTEMBER, 1959

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## Officers of the Association of American Medical Colleges, 1958-1959

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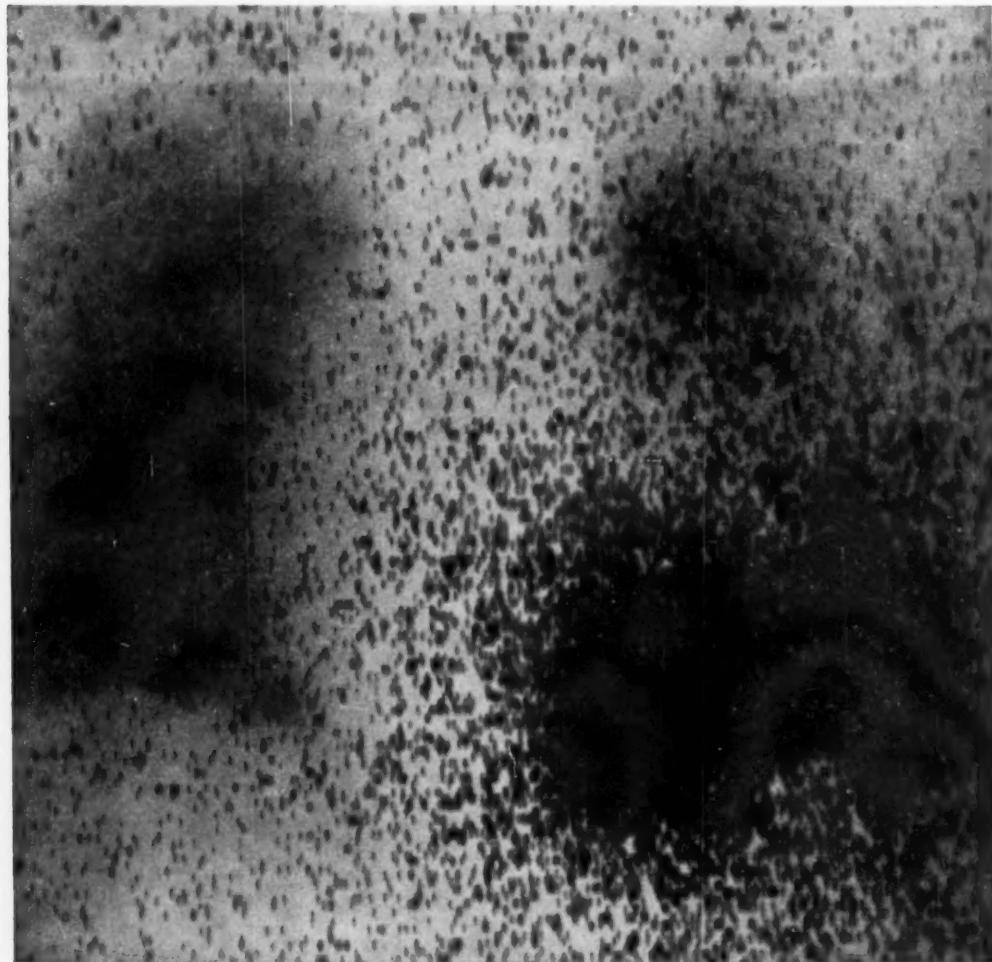
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# Self-portrait: Au<sup>198</sup>

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Photoscan courtesy of Vincent P. Collins, M.D., Department of Radiology, Baylor University College of Medicine, Houston, Texas

THERAPEUTIC DIRECTION THROUGH BASIC RESEARCH



# The Role of Conditional Gifts and Grants in the Medical School of Today

K. M. ENDICOTT, M.D.\*

National Institutes of Health, Bethesda 14, Md.

## INTRODUCTION

During the fall and winter of 1958-59 a staff committee of the National Institutes of Health made a study of twenty medical schools to obtain information regarding major operational problems related to the support of research and training through conditional gifts and grants. On April 15, 1959, the committee submitted its final report to Dr. James A. Shannon, Director of the National Institutes of Health.

Although the study was undertaken for purposes of program planning at the National Institutes of Health, it is believed that some of the factual data will be of interest to medical educators. In this report the author has attempted to eliminate those portions of the study which dealt with attitudes and opinions as well as those areas in which the interpretation of data is uncertain or controversial.

The historical data presented below were derived primarily from two earlier studies of these schools. The first of these was that of the Surgeon General's Committee on Medical School Grants and Finances, 1949 (commonly known as the Lowell Reed study). The second was the Survey of Medical School Faculties carried out by the Office of Defense Mobilization and the Association of American Medical Colleges in 1950-51.

The following schools were included in the present study:

### Public (State-Owned) Medical Schools

1. Medical College of Alabama
2. University of Colorado School of Medicine

\* Associate Director, National Institutes of Health, Public Health Service, U.S. Department of Health, Education, and Welfare.

3. Indiana University School of Medicine
4. State University of Iowa College of Medicine
5. Louisiana State University School of Medicine
6. University of Minnesota Medical School
7. State University of New York, Downstate Medical Center
8. University of Oklahoma School of Medicine
9. University of Utah School of Medicine
10. University of Vermont College of Medicine
11. University of Washington School of Medicine

### Private Medical Schools

1. University of Southern California School of Medicine
2. Stanford University School of Medicine
3. Yale University School of Medicine
4. University of Chicago, The School of Medicine
5. Tulane University of Louisiana School of Medicine
6. Washington University School of Medicine
7. Duke University School of Medicine
8. University of Pennsylvania School of Medicine
9. Vanderbilt University School of Medicine

Current data presented below were provided by the schools in response to a questionnaire which each school completed and submitted following a 2-3-day visit by a staff team of the National Institutes of Health. Following a preliminary tabulation of the data, representatives of the schools met with the committee and subsequently submitted additional data and corrections. For a variety of reasons, several schools did not supply complete information in some areas of inquiry. It has been necessary to eliminate those schools in certain of the tables in this report, but in each instance the number of schools included in the table is indicated.

This report will present historical and current data on (a) sources of income and patterns of expenditure for basic operations and separately budgeted research, (b) size and distribution of the faculty and source of

faculty salary, and (c) construction of new facilities.

BASIC OPERATIONS AND SEPARATELY BUDGETED RESEARCH

*Definition of terms.*—In order that comparisons might be made between current data and those of earlier reports it was necessary to obtain the same financial analyses. The cost of *basic operations* as used here includes the cost of instruction, administration, library, plant operation, and those items in support of research which are *not* separately identified as such in the school's budget, but *excludes the cost of separately budgeted research and the cost of operating hospitals, clinics and medical service programs*.

The term *separately budgeted research* in-

project. Gifts for endowment or construction are not included.

*Expenditures for basic operations and separately budgeted research.*—In the sixteen schools for which complete information is available there has been a substantial increase in expenditures over the past decade (see Table 1). Expenditures for basic opera-

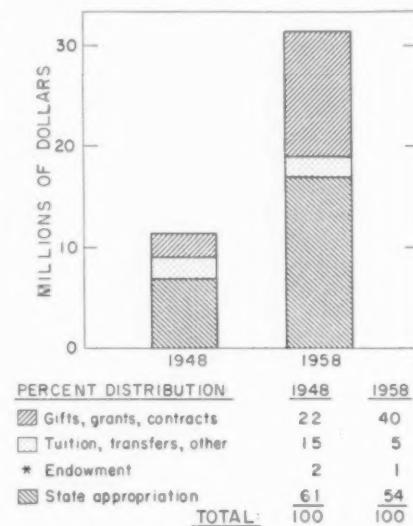
TABLE 1  
EXPENDITURES FOR BASIC OPERATIONS  
AND SEPARATELY BUDGETED  
RESEARCH

In nine public and seven private medical schools, 1948-58		
EXPENDITURES IN MILLIONS OF DOLLARS		
BUDGET ITEM	1947-48	1957-58
Basic operations	\$16.0	\$34.2
Separately budgeted research	4.4	24.8

cludes gifts, grants, and contracts for research as well as those institutional funds for support of research which are *so designated in the school's budget*. It should be emphasized that a substantial support for research is contained within basic operations and to some extent in other budget items excluded from this report such as hospital costs.

The term *expenditures by source of income* refers to actual expenditures rather than income, in order to eliminate the necessity for recording and explaining deficits or surpluses.

The term *conditional gifts, grants, and contracts* refers to funds given to the institution on the condition that the funds be spent for operating costs within a designated time for a designated purpose such as a research



\* Included with tuition, transfers and other in the chart.

CHART 1.—Expenditures by source of income for separately budgeted research and basic operations at nine public medical schools, 1948-58.

tions increased from an average of \$1 million per school in 1948 to \$2.1 million in 1958. Expenditures for separately budgeted research increased from an average of \$275,000 in 1948 to \$1,547,000 in 1958.

*Expenditures by sources of income.*—Because of the major differences in source of income the nine public (state) schools and seven private schools are presented separately. In the public schools there has been a major increase in state appropriations as well as a major increase in conditional gifts, grants, and contracts (see Chart 1). It is noteworthy that in 10 years gifts, grants,

and contracts have increased from 22 to 40 per cent of total expenditures for basic operations and separately budgeted research.

Chart 2 portrays expenditures by source of income at seven private medical schools. Here the role of gifts, grants, and contracts is even greater than in the public schools, and amounted to 62 per cent of the total expenditures for basic operations and separately budgeted research in 1958.

*Purposes for which gifts, grants, and contracts were given.*—In these sixteen schools the conditional gifts, grants, and contracts were for a variety of purposes, but primarily for research (73 per cent) or for training (23 per cent).

The largest single source of funds was the Public Health Service which accounted for 49 per cent of the total gifts, grants, and contracts (see Table 2).

A number of these gifts, grants, and contracts were accompanied by an additional sum of money allowed for indirect costs. These allowances for indirect costs are shown in Table 3, and average 8.7 per cent of the direct cost.

*The total cost of research.*—With accounting procedures now in use at most of the medical schools it has not been possible for the committee to determine accurately the total cost of research. There is no unanimity as to the proper method for determining indirect costs. Furthermore, most schools do not charge such items as senior faculty salaries against research, so that the "separately budgeted research" item does not contain the full direct costs.

In an effort to develop an approximate estimate of the total cost and the share borne by the school, the staff committee made special inquiries in a few schools and believes that the estimate shown in Table 4 is on the conservative side. In these sixteen schools "separately budgeted research" in 1958 was \$24.8 million. It was assumed (a) that 10 per cent of the direct costs, such as salaries of investigators, are not budgeted in the item called "separately budgeted re-

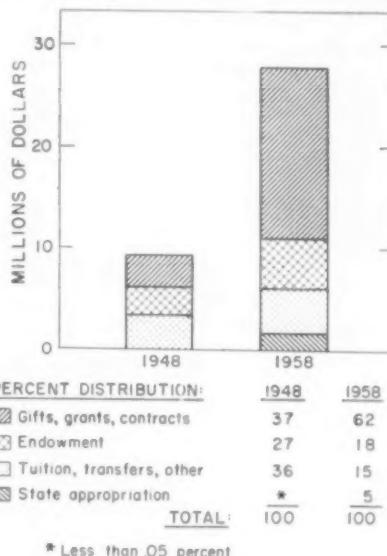


CHART 2.—Expenditures by source of income for separately budgeted research and basic operations at seven private medical schools, 1948-58.

TABLE 2  
TOTAL CONDITIONAL GIFTS, GRANTS, AND CONTRACTS  
Excluding allowances for indirect costs, by source of funds and purpose, at nine  
public and seven private medical schools, 1957-58

SOURCE	Total	THOUSANDS OF DOLLARS		
		Research	Purpose Training	Other
Total gifts, grants, and contracts (Per cent)	\$29,733 (100%)	\$21,761 (73%)	\$5,832 (20%)	\$2,140 (7%)
Public Health Service	14,584	10,841	3,520	223
Other Federal	2,955	2,553	233	169
Non-Federal	12,194	8,367	2,079	1,748

search" and (b) that indirect costs average 25 per cent of direct costs. The estimate suggests that the full cost is nearer \$34 million than \$24.8 million. Of this estimated \$34 million, about 30 per cent would have to be derived from institutional funds, since gifts, grants, and contracts including allowance for indirect costs provide only about \$24 million.

TABLE 3

INDIRECT COST ALLOWANCES ACCOMPANYING  
GIFTS, GRANTS, AND CONTRACTS  
By source, at nine public and seven private  
medical schools, 1957-58

Source	Indirect cost allowance (\$000)	Per cent of direct cost
Total	\$2,573	8.7
Public Health Service	1,619	11.1
Other Federal	459	15.5
Non-Federal	495	4.1

TABLE 4

ESTIMATED TOTAL COST OF RESEARCH IN  
NINE PUBLIC AND SEVEN PRIVATE  
MEDICAL SCHOOLS, 1957-58

SOURCE	COSTS (MILLIONS OF DOLLARS)		
	Direct	Indirect	Total
Total	\$27.3	\$6.8	\$34.1
Gifts, grants and contracts	21.8	2.2	24.0
Institutional funds	5.5	4.6	10.1

*Federal support of research.*—In these sixteen schools substantial support was provided through Federal grants and contracts for research. Thus in 1958, of the direct costs, approximately \$10.8 million came from National Institutes of Health grants and \$2.6 million from other Federal grants and contracts. Figures on indirect cost allowances for research grants and contracts (as contrasted with all grants and contracts referred to in the preceding section) are not available.

## FACULTY TRENDS

*Definition of terms.*—In accordance with definitions in the Office of Defense Mobilization study of 1950-51, *full-time faculty* in-

cludes all those with the rank of instructor or above who devote to the school 1920 hours per year or more. *Part-time faculty* includes all those with the rank of instructor or above who devote more than 25 but less than 1920 hours per year. Those devoting less than 25 hours are not enumerated. Time spent in private practice is not included.

The term *full-time equivalent* is used in this paper as an expression of the amount of time devoted to (a) teaching and patient care, (b) research, and (c) administration. In converting to *full-time equivalents* those faculty members spending 1920 hours or more per year at the school were considered to be full-time and were distributed to the three activity areas in proportion to the

TABLE 5

CHANGE IN NUMBER OF FACULTY MEMBERS  
IN THE EQUIVALENT RANK OF IN-  
STRUCTOR OR ABOVE

At ten public and six private medical schools  
1951-59

ITEM	1951	1959
Total faculty	3053	6141
Full-time (devoting 1920 hours or more per year)	947	2263
Part-time (devoting more than 25 but less than 1920 hours per year)	2106	3878

time devoted to each activity. Faculty members devoting more than 25 hours but less than 1920 hours per year in all three activities were considered to be part-time. The hours spent by the part-time faculty in each of the three areas were divided by 1920 to determine the full-time equivalents in the three areas.

*Number of faculty members.*—In the 9 years since 1950 the sixteen schools submitting data report a doubling of faculty (see Table 5).

Some departments have grown more rapidly than others. Chart 3 portrays the rate of increase of full-time faculty in the major preclinical and clinical departments. It is interesting to note that most clinical departments have grown more rapidly than most preclinical departments.

*Changes in faculty activities.*—With the rapid increase in research expenditures one might expect a major change in the distribution of faculty time devoted to various activities. To estimate the magnitude of the change an analysis was made of the hours spent by the faculty in (a) teaching and patient care, (b) research, and (c) administration. In order to compare the results with the Office of Defense Mobilization study of 1951, the results are expressed as "full-time equivalents."

Results are shown in Table 6. It is interesting to note that there is a substantial increase in the relative emphasis on research. In the preclinical departments research accounts for more than half of the faculty time, whereas it occupies less than one-third the time of the clinical faculty.

*M.D. faculty and Ph.D. faculty.*—Along with the increased emphasis on research there has come an increase in the percentage of Ph.D. faculty in clinical departments—from 7 per cent in 1951 to 13 per cent in

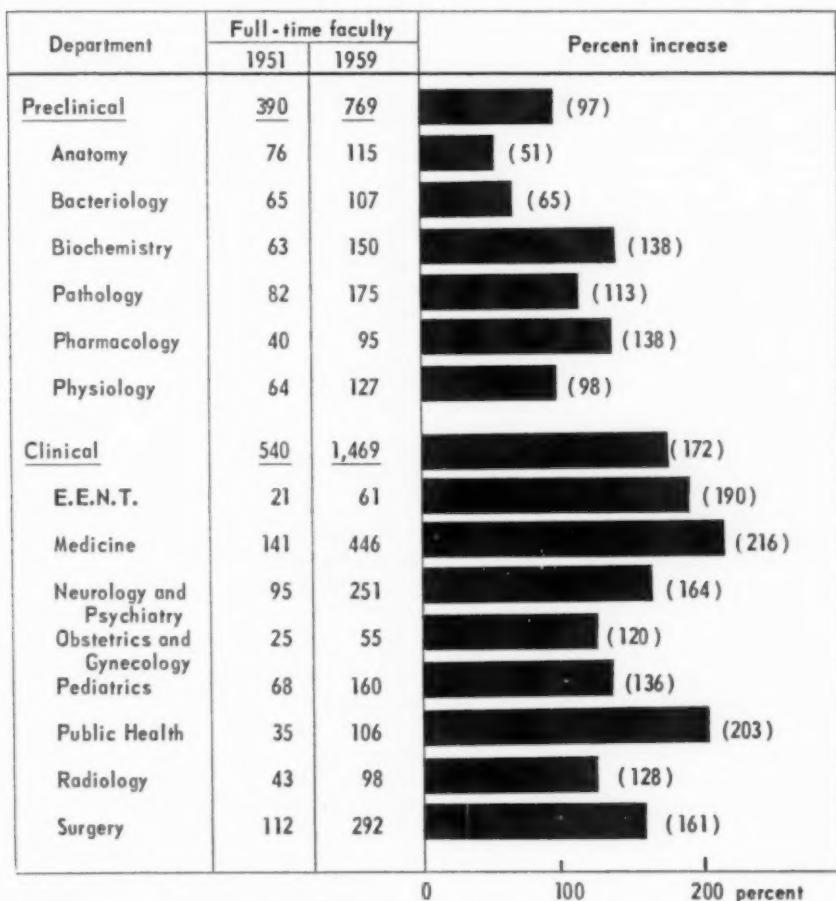


CHART 3.—Increase in numbers of full-time faculty members, by department at ten public and six private medical schools, 1951-59.

1959. At the same time the percentage of M.D. faculty in preclinical departments has dropped from 43 per cent in 1951 to 35 per cent in 1959.

As a result of these changes, the ratio of full-time M.D. faculty to full-time Ph.D. faculty has declined (2.6 to 1 in 1951, 2.2 to 1 in 1959) (see Table 7).

*Faculty paid from conditional gifts, grants, and contracts.*—One of the major causes of concern in the surveyed schools is the growing problem of career instability of faculty members whose salaries are derived from short-term conditional gifts and grants.

Few of these faculty members enjoy permanent appointments, and many are excluded from a variety of fringe benefits. In the sixteen schools supplying full reports 36 per cent of the total *paid* full-time faculty receive part or all of their salaries from conditional gifts, grants, and contracts.

Thus, of 2194 paid full-time faculty only 1405 were paid entirely from institutional funds. Those paid in full or in part from grant funds received support from a variety of sources and combinations of sources (see Table 8).

Support of faculty salaries from grant

TABLE 6

DISTRIBUTION OF FULL-TIME EQUIVALENT FACULTY IN TEN PUBLIC AND SIX PRIVATE SCHOOLS, BY FUNCTION, 1951-59

ITEM	Total	FULL-TIME EQUIVALENT STAFF			Other
		Preclinical	Clinical	900 (100%)	
Total, 1950-51:	1,394 (100%)	484 (100%)	900 (100%)		10
Teaching and patient care	773 (56)	194 (40)	573 (64)		6
Research	450 (32)	239 (49)	210 (23)		1
Administration	171 (12)	51 (11)	117 (13)		3
Total, 1958-59:	2,771 (100%)	861 (100%)	1,884 (100%)		26
Teaching and patient care	1,404 (51)	289 (34)	1,113 (59)		2
Research	1,051 (38)	482 (56)	558 (30)		11
Administration	316 (11)	90 (10)	213 (11)		13

TABLE 7

FULL-TIME FACULTY BY DEGREE IN PRE-CLINICAL AND CLINICAL DEPARTMENTS  
At ten public and seven private medical schools, 1951-59

DEGREE AND DEPARTMENT	NUMBER OF FACULTY MEMBERS	
	1951	1959
Total:	1053	2477
M.D.	716	1588
Ph.D.	279	707
Other	58	182
Preclinical, total:	439	826
M.D.	188	288
Ph.D.	226	498
Other	25	40
Clinical, total:	614	1651
M.D.	528	1300
Ph.D.	53	209
Other	33	142

funds is predominantly in the lower ranks. Of 457 *paid* full-time professors, 43 (9 per cent) received part or all of their salaries from Federal research or training grants as compared to 297 (39 per cent) of the 757 paid full-time instructors. See Table 9.

EXPANSION OF FACILITIES

During the past decade nearly all schools have built some new buildings. In the eighteen schools for which figures are available, the cost of this construction was \$129 million. Teaching facilities represented 26 per cent, research facilities 21 per cent, and hospitals and clinics 44 per cent; another 9 per cent went for miscellaneous construction, such as general service, administration, and student housing.

Table 10 shows the type of construction

and source of funds by type of school. The public schools spent an average of \$8.4 million per school, while the private schools averaged \$5.5 million per school for the period 1948-57. It is especially important to note that while the private schools have had no help from state and local governments, the public schools have derived 24 per cent of their funds for construction from non-governmental sources.

#### SUMMARY AND CONCLUSIONS

During the past decade the schools in this survey have grown rapidly. The faculties have doubled, expenditures have tripled, and facilities have been improved and expanded. Research has emerged as a major activity.

Gifts, grants, and contracts provide approximately half of the total income. Thirty-six per cent of the faculty is paid in full or in part from "soft" money. A substantial portion (perhaps as much as 15 per cent) of the school's own funds must now be used to sup-

ports, and contracts has done much to make possible the development of research programs and training programs which the faculties wanted and which couldn't have been financed with institutional funds. It seems virtually certain that faculty pressure upon the school administration to accept

TABLE 8

## SOURCE OF SALARY

I. Total full-time faculty	2263
A. Institution funds only	1405
B. Grant support only	514
1. Federal only	332
2. Non-Federal only	159
3. Both Federal and non-Federal only	23
C. Institution funds and grant support	275
1. Federal grants and institution funds	182
2. Non-Federal grants and institution funds	75
3. Federal and non-Federal grants and institution funds	18
D. Not paid	69

TABLE 9

## SOURCE OF SALARY FOR FULL-TIME FACULTY, BY ACADEMIC LEVEL, IN TEN PUBLIC AND SIX PRIVATE SCHOOLS, 1958-59

Academic rank	Total	Receiving total salary from Federal grants	Receiving part of salary from Federal grants	Receiving no salary from Federal grants	Not paid
Total	2263	332	223	1639	69
Professor	460	5	38	414	3
Associate professor	416	20	52	338	6
Assistant professor	586	73	70	427	16
Instructor	801	234	63	460	44

port the indirect costs associated with these gifts, grants, and contracts.

These developments have undoubtedly resulted in decreased institutional autonomy and faculty security. If the trends of the past decade continue without compensatory measures it seems likely that there will be serious consequences. Faculty positions will be less and less attractive. The schools will have less and less ability to plan and reach institutional objectives.

On the other hand, the increase in gifts,

additional "soft" money will continue, even at the expense of institutional stability and autonomy.

The extent to which the schools may be able to compensate by finding additional "hard" money is a moot question. In general, the public schools appear to be meeting this problem more successfully than the private schools.

The National Institutes of Health staff committee, which made this study, concludes that granting agencies like the Public

Health Service can and should provide at least partial solution to these problems by (a) paying full costs on grants and (b) providing fluid research support in the form of long-term institutional grants, in order to reinforce institutional autonomy and to provide funds for stabilizing careers of faculty paid from grant funds.

TABLE 10  
EXPENDITURES FOR CONSTRUCTION, BY SOURCE OF FUNDS AND PURPOSE  
At ten public and eight private medical schools  
1948-57 (millions of dollars)

Source of funds and primary purpose of construction	Total	Public schools	Private schools
<b>Total</b>	<b>\$128.6</b>	<b>\$84.3</b>	<b>\$44.3</b>
<b>By source of funds:</b>			
State and local government	52.8	52.8	...
Federal government	24.1	11.1	13.0
Other sources	51.7	20.4	31.3
<b>By primary purpose:</b>			
Teaching facilities	33.6	25.2	8.4
Research facilities	26.8	13.7	13.1
Teaching hospital	56.2	37.8	18.4
Other	12.0	7.6	4.4

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# Internships and Residencies

## Historical Backgrounds and Current Trends

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A survey of the current scene in the United States as it concerns hospital internships and residencies reveals most vividly that these programs, like the vast scale of American hospitalization to which they are so intimately related, are now quite definitely in the realm of "big business." Both represent immense investments and heavy financial annual outlay for education and a multiplicity of medical service purposes. With 853 hospitals offering 12,626 internships, and 1,276 hospitals providing 31,665 residencies, it is difficult to appreciate fully how many years this development represents, and yet how recently this tremendous array of graduate educational resource has come into being.

The original American hospitals, established successively in Philadelphia, New York, and Boston,<sup>1,2</sup> were founded under the leadership of physicians who for the most part had obtained their medical education at the Universities of Edinburgh, London, Leyden, and Paris. Hence, as a matter of course, our early undergraduate curricula and house staff patterns were

strongly influenced by British and European models. Even a brief exploration into the sources of those inspirations reveals how gradually, deviously, and almost haphazardly the quite standardized present-day programs of the medical schools, internships, and residencies have evolved. Actually, records of the steps by which hospital house staff arrangements metamorphosed, both abroad and in this country, are surprisingly meager. An inquiry to Dr. Douglas Guthrie, the medical historian at Edinburgh University, brought the reply, "I should imagine, though I lack printed reference, that the practice dates from the 18th century, and that the house-surgeons and house-physicians were originally apprentices. But no one seems to have paid any attention to this detail of medical history. For centuries, apparently, those who held such posts at the Royal Infirmary of Edinburgh have been called the 'residents,' living, as they still live, in the 'residency' within the hospital."<sup>3</sup>

Turning to sources available, I am indebted to my son William, a United States Public Health Officer in London, for researches into materials to be found among that city's famous old hospitals.

Interestingly, the first formal system of hospital training was instituted by the Society of Apothecaries (chartered by James I) as early as 1617.<sup>4</sup> It consisted of a 7-year

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<sup>1</sup> In 1737, the institution later known as The Charity Hospital of Louisiana was opened in New Orleans. "It served the purpose of an almshouse as well as a hospital, and therefore cannot be considered as antedating the Pennsylvania Hospital as a hospital, in the strict sense of the term, for the care of the sick and injured." (Packard, F. R., M.D., *History of Medicine in the United States*, 1: 261-62, Paul B. Hoeber, Inc., New York, 1931.)

<sup>2</sup> Annual Report on Graduate Medical Education in the United States: J.A.M.A., 165: 521-657, 1958.

<sup>3</sup> Personal communication from Dr. Douglas Guthrie, medical historian, Edinburgh University, August 25, 1958.

<sup>4</sup> Cameron, H. C. Mr. Guy's Hospital, 1726-1948. Toronto: Longmans, 1954.

apprenticeship, during which these novices followed their masters on rounds, observed methods employed in the care of patients, and assisted with treatments. Apparently, their responsibilities were slight.

It was not until after 1662 that St. Bartholomew's, London, Guy's, St. Thomas', and St. George's Hospitals opened their wards to students and apprentices. We know that John Hunter was a surgeon's pupil at St. George's until 1756, when he was appointed house-surgeon. Mr. Joseph Warren, surgeon to Guy's, wrote a letter to one of Hunter's bitter rivals, Mr. Gunning at St. George's, in which he described the student house staff arrangements over the previous half-century. Each surgeon was permitted four pupils and dressers, the former's only business being "to look on and make inquiries," while the latter were permitted to practice dissection, and serve a week in rotation treating accident cases. Tuition for the two groups was 25 and 50 pounds, respectively.

At "Bart's"<sup>6</sup> where John Abernethy initiated a regular curriculum of medical lectures in 1787, there were resident apothecaries until 1854 when their designation was changed to "Resident Medical Officers." It remained thus until the late nineteenth century when it was amplified to House Physician, House Surgeon, and Registrar.

At Edinburgh<sup>6</sup> in 1744, a "Clerk of the House, educated in medicine" was appointed at the Royal Infirmary with duties resembling those of a house physician and surgeon. He kept lists of patients, wrote histories, recorded progress notes, visited the wards morning and afternoon, attended to ordering of diets, sent prescriptions to the apothecary, inspected students' tickets, and prepared annual reports. To give his activities an even more modern ring, it was recorded that he got into a quarrel with the matron and then with others of his associates and had to resign! Some years later the positions

<sup>6</sup> Power, Sir D'Arcy. *A Short History of St. Bartholomew's Hospital 1123-1923, past and present*. London: C. Whittingham & Griggs, 1923.

<sup>7</sup> Turner, A. L. *The Story of a Great Hospital, the Royal Infirmary of Edinburgh, 1729-1929*, Edinburgh: Oliver and Boyd, Ltd., 1937.

of "Physician's and Surgeon's Clerks" were established with salaries of ten pounds per annum, with duties which included collecting fees from the patients! One clerk, a Mr. Butler, served 10 years before taking his doctor's degree, and was given a bonus of 10 pounds as a reward for his success in collecting fees!

When we turn to the colonial American hospitals, we find that the first, The Pennsylvania Hospital,<sup>7</sup> with its original wards continuously in service since 1751, employed house staffs from the beginning. "In 1773 the Managers decided to take the apprentices to live in the house in order to learn the art of medicine, as there was no medical college in the country at that time."

For the apprentices an actual indenture was drawn up by which the friends of the apprentice bound him to serve the hospital for 5 years, "the Managers in their part agreeing to instruct him in the art of medicine, etc." On completion of the service, the apprentice was given a suit of "cloathes" and an engrossed certificate. Subsequently, "resident students" were made indentured apprentices, while the apprentices took regular lectures at the University, receiving their degrees at the end of the 5 years of indenture.

Jacob Ehrenzeller was the first House Physician at the Pennsylvania Hospital in 1773 and served 5 years, the predecessor of the long line of such men in residence continuing to the present day. The first recorded use of the term "interne" at that hospital apparently was in 1938.

At "Old Blockley," now the Philadelphia General Hospital, an assistant apothecary and four house pupils served as early as 1789.<sup>8</sup> The latter, who were apparently really apprentices, were required to pay \$100 a year "for the benefit of the house." By 1813 the requirements for appointment were

<sup>7</sup> Morton, T. G. *The History of the Pennsylvania Hospital—1751-1895*, Philadelphia: Times Printing House, 1897.

<sup>8</sup> Agnew, D. H. *The Medical History of the Philadelphia Almshouses*. Lecture delivered October 15, 1862. Printed in *Philadelphia Hospital Reports, Volume I*, 1890.

preceptorship under a recognized practitioner for 2 years and having attended one course of medical lectures, and the payment of \$100 and a bond for faithful fulfillment of duties. Two were juniors and two were seniors. By 1828 the seniors were called "resident physicians" and paid \$250 a year for the privilege.

According to Dr. Robert J. Hunter<sup>9</sup> of Philadelphia his researches have revealed that the names "apothecary" and "assistant apothecary," in use in 1780, were changed to "resident" in 1823 (the equivalent of "intern" in the modern sense). According to Doctor Hunter the use of the term "resident" in the old sense was replaced by the designation "interne" only after World War II. He added, "Our Ex-Residents Association of PGH (really an organization of 'internes'), organized circa 1885-9, refused to admit residents (in the modern sense) until about 6 years ago, in 1952."

In the first report of the New York Hospital in 1797,<sup>10</sup> the name of Samuel Barnum, House Surgeon, appeared as the only house officer. In 1804 another was added, a House Apothecary, who not only functioned as a combination house physician, druggist and librarian but alternated with the house surgeon in the delivery room!<sup>11</sup> By 1809 the position of house physician was created. To qualify for these positions candidates must have served 1 year of preceptorship, taken a formal course of lectures, and then spent a third year as a nonresident hospital assistant.<sup>12</sup> At the Bellevue Hospital the terms "assistant resi-

<sup>9</sup> Hunter, R. J. *The Origin of the Philadelphia General Hospital*. Philadelphia: Blockley Division, Rittenhouse Press, Inc., 1955.

<sup>10</sup> Report of State of New York Hospital for the Year 1797, No. 1.

<sup>11</sup> Brief Account of the New York Hospital, New York. Section VII, p. 30. New York: Isaac Collins & Son, 1804.

<sup>12</sup> Internships and Residencies in New York City, 1934-1937. Their Place in Medical Education: Report by the New York Committee on the Study of Hospital Internships and Residencies, p. 28. Jean Alonzo Curran, Executive Secretary. New York: The Commonwealth Fund, 1938.

dent" and "resident" were employed for many years.<sup>13</sup>

In 1859, John Shaw Billings<sup>14</sup> became resident at a Cincinnati hospital after only one academic "year" of 5 months at the Miami Medical College. He reported years later, "There was I a resident of the City Hospital of one hundred and fifty beds, where I was left practically alone for the next six months, the staff not troubling themselves very much to come during the summer time when there was no teaching." "I practically lived in the dissecting room and in the clinic, and the very first lecture I ever heard was a clinical lecture." His preceptor was the outstanding surgeon, George C. Blackman, from whom he received the training to make possible a distinguished surgical career in the Civil War. His entire student-hospital resident experience had been encompassed by 2 calendar years! Genius can surmount inadequate educational opportunity!

By 1870 in New York<sup>15</sup> candidates for hospital appointment must have completed 3 years of medical study (which presumably included the preceptorship), before being admitted to a competitive examination. "In the first eight months the 'junior walker,' as he is called, has no responsibility, but he receives his orders from the house-surgeon or physician, according as he is on the medical or 'surgical side.' He dresses wounds, bandages limbs, cups, copies cases into a notebook, lunches every day at the expense of the Hospital, but goes home at night.

"The senior walker (during the second eight months) dresses fractures, writes the history of cases as he takes it from the patient's lips, which the junior copies, while the house-surgeon, the only one of the three who lives in the Hospital, has the general supervision of all the patients, subject, as before indicated, to the direction of the

<sup>13</sup> *Ibid.*, p. 31.

<sup>14</sup> Reports of Societies, Harvard Medical Alumni Assoc.: Boston Medical and Surgical Journal, CXXXI:140-42, 1894.

<sup>15</sup> Roosa, D. B. St. J. *The Old Hospital*, Putnam's Magazine, Sept., 1869. Reprinted in Medical Register New York and Vicinity, 1870-71, pp. 91-107.

attending physician or 'head doctor'.... "There were three sets of these doctors—two on the surgical and one on the medical side—to care for about three hundred and seventy-five sick."

Morning rounds by the house-physician or house-surgeon during their final 8 months of service were very picturesquely described—"He then buckles on his armor, or, in plain English, seizes his case of instruments, and with the senior and junior walker at his side, he starts on his rounds. The Emperor of Russia, the Viceroy of Egypt, or our late President, Andrew Johnson, never felt more acutely the weight of supreme power than did the house-surgeon or physician of the New York Hospital as he was about to pass into a realm over which he was the undisputed master...." "No nonsense, no fuss, no haste, but calm, sympathetic questions and gentle manipulations."

Worthy of note in this vivid account of 1869 is that the appellation "interne" had not yet been imported from France, the term "walker" was then used but has long since been forgotten, and the case-load was very high—40 patients to each of these young doctors-in-training.

The "houseship" system was quite strongly entrenched in New York and elsewhere until the 1930's,<sup>12</sup> when the rapid rise of the specialty boards stimulated a corresponding demand for residency opportunity. That development, and the military restriction of World War II, resulted in the present uniform reduction of the internship to 1 year, and replacement of the time-honored "houseships" by the longer-term residencies.

*Houseships at the Massachusetts General Hospital.*—At the Massachusetts General Hospital<sup>13</sup> incorporated in 1811 and to which the first patients were admitted in 1821, the first house officer appointed was an apothecary, who must have completed one year as a medical student. He worked under the direction of the Physician and Surgeon,

cared for drugs and surgical instruments, and administered medicines. Students of the Massachusetts Medical College, which belonged to Harvard University, were admitted by ticket "to see the practice of the Hospital," at a fee of \$30.00 per ticket. One of them acted as Dresser and others as Student Assistants. By 1828, the apothecary's duties were transferred to a House Physician, and in 1830 a Pharmacist was appointed. There were then a House Physician and a House Surgeon on duty, who resided in the Hospital. Shortly thereafter, their number was doubled.

In 1849, for disciplinary reasons, the House Officers were reduced to two and House Pupils of 2 years' student standing were added. Subsequently, that unique title "became a title of honor borne worthily by generation after generation of House Pupils." By 1872 they were required to live in the Hospital and given their meals there. The first resident (in surgery) was not appointed until 1911. The title "interne" was not mentioned until a report of the General Executive Committee in 1913, another evidence of the late appearance of this term on the American scenes in medical education.

*House Staffs of the United States 1872-1873.*—In the report by Toner for the American Medical Association of that academic year, based upon information from 178 hospitals, a total of 309 resident medical officers was recorded. Interestingly, only nine of all the hospitals were connected with medical colleges, and 36 provided clinical instruction.<sup>17</sup>

*House Staff Experience of University of Pennsylvania Graduates 1879-1893.*—In an address delivered October 2, 1893, on the general progress of medical education, Pepper<sup>18</sup> reviewed the records of almost 800

<sup>12</sup> Toner, J. M. Statistics of Regular Medical Associations and Hospitals of the United States: Section II, Statistics of the Hospitals in the United States, 1872-73, derived from Inquiries by the U.S. Bureau of Education, Trans. A.M.A., 24:314-33, 1873.

<sup>13</sup> Washburn, F. A. *The Massachusetts General Hospital—Its Development, 1900-1935*, pp. 146-98. Boston: Houghton Mifflin Company, 1939.

<sup>14</sup> Pepper, W. *Higher Medical Education, the True Interest of the Public and of the Profession*, p. 74. Philadelphia: J. B. Lippincott Company, 1894.

graduates of the University of Pennsylvania Medical School and learned that "each class has reached what must be regarded as a highly gratifying average of professional income . . ." "No less gratifying is it to learn that no fewer than six hundred out of a total of eighteen hundred and thirty-four graduates had secured appointments as resident physicians, the large majority of the positions being won in competitive examinations."<sup>19</sup>

*Early Beginnings at the University of Michigan.*—The first reference to house staff at Ann Arbor<sup>20</sup> was in 1881, "the older (for residence) portion of the hospital (was) occupied by the Resident Physician, Matrons, and private rooms for very sick patients." The University Hospital was built in 1891 "one of the few large hospitals of the country and one of the very few maintained under university auspices . . ."<sup>21</sup> When rebuilt in 1925 it contained an "interns' home."

"Throughout the early years of the hospital, the problems of interns, or house physicians, was never satisfactorily settled. Although essential to the proper conduct of a hospital, for many years they occupied an inferior position and were more or less looked down upon by the hospitals' chiefs."<sup>22</sup> A house physician, later called "resident physician," was first appointed in 1874 and doubtless performed many of the functions of an intern. A house physician and a house surgeon were listed in the 1895 "Announcement." Of great interest is the finding that the first interns under that designation, four in number, were listed in the Calendar for 1899-1900 and were given a salary of \$125 a year with room and board.

*First Recorded References to Hospital Interns.*—The title, "interne," has been in use in France for more than a century, and in the French system of graduate education corresponds closely in position, oppor-

tunity, and responsibility to the American medical or surgical resident, for it represents the final highly specialized clinical and pathological experience for the chosen few. Hence, French internes and American interns are at quite different stages of training. Since records of American use of the term appear to be lacking until around the turn of the 20th century, it does not seem to have been a direct transfer of concept, but was adapted instead to distinguish between the first year of hospital experience for the graduate, and the newly introduced residency system which Halsted initiated at Johns Hopkins Hospital on his becoming Professor of Surgery there in 1890. After years of opposition in other centers, the internship-residency system has now been fully accepted everywhere in this country.

A study of records to date indicates that the first mention in a hospital communication of interns as such was at the initial meeting of the Advisory Board of the Medical Faculty of Johns Hopkins Hospital in 1897.<sup>23</sup> "One matter was brought up by Dr. Welch for discussion which was of interest to both the School and the Hospital. This was the question of the method to be adopted in the selection of interns for the Hospital from the graduating class" (the first at Johns Hopkins University School of Medicine).

In a report to the Medical Faculty prepared by Dr. Henry M. Hurd, Hospital Superintendent, one month after the Advisory Board meeting, was the following paragraph:<sup>24</sup>

"The Committee appointed at the last meeting to report upon the appointment of internes from the graduating class of the Johns Hopkins Medical School, would make the following recommendations: . . ." The hospital service was for one year. Twelve persons were to be selected and were given a rotating service of four months

<sup>19</sup> The University of Michigan—An Encyclopedic Survey, Vol. V, p. 955. Ann Arbor: University of Michigan Press, 1951.

<sup>20</sup> *Ibid.* p. 958.

<sup>21</sup> *Ibid.* p. 973.

<sup>22</sup> Chesney, A. M. The Johns Hopkins Hospital and the Johns Hopkins University School of Medicine: A Chronicle, Vol. II, 1893-1905, p. 151. Baltimore: The Johns Hopkins Press, 1958.

<sup>23</sup> *Ibid.*

each in the medical, surgical and gynecological services.<sup>24</sup>

Mary Louise Marshall, Librarian of the Rudolph Matas Medical Library at Tulane University School of Medicine, wrote the author on June 4, 1959, concerning the use of the term "intern" at Tulane. She said that until 1912 there was one category only at the Charity Hospital, "resident staff," although a physician who was listed as a resident student in 1905-6 says that they called themselves internes even though they were undergraduates. In December of 1912 Dr. S. S. Goldwater referred to the resident students as "interns," although up to this time there would seem to be no official sanction for this. The Hospital report for 1912 listed Junior and Senior interns for the first time.

*Role of the American Medical Association in formalization of internships and residencies.*—Although the American Medical Association was organized in 1847 with the avowed purpose of improving medical education in the United States, little was accomplished over the next half century. While the 75th Anniversary of the founding of the *Journal of the American Medical Association* was celebrated in 1958, it was not until 1901 that the first education number of the journal appeared. Over 30 years elapsed between the founding of the *Journal* and the listing of internships available in American hospitals, in the issue which appeared in 1914. The list revealed that only approximately one half of the graduates of the then existing medical schools could obtain internship appointments of any kind in this country. That deficiency was recognized 10 years earlier, since in 1904 there was a scathing editorial in the *Journal of the American Medical Association*<sup>25</sup> regarding the lack of graduate experience among American hospitals in the following terms: "Why do our students go to the German

<sup>24</sup> In a personal communication, Dr. Alan M. Chesney states that, "The official title for 'internes' in the Johns Hopkins Hospital was 'resident house officer' from 1897 to 1954, in spite of the fact that Dr. Hurd used the term in his report."

<sup>25</sup> J.A.M.A., 43:469-70, 1904.

hospitals? It is not so much because of insufficiency of material at home; it is rather that they are certain of receiving in the wards the personal instruction of the best men in Germany." "What certain great free hospitals in this country need is a reorganization of the medical service which shall secure an adequate number of internes and attending men who shall not be 'figureheads.'"

Incredible as it may seem today, it was not until 35 years ago in 1923 that for the first time there were enough openings among the hospitals of this country to supply all of the graduates from the medical schools with internships.<sup>26</sup>

Four years later, in 1927, the *Journal of the American Medical Association*<sup>26</sup> published its first list of residencies. In contrast to the immense number of residency opportunities now available, there were less than 2000 residencies on that original list!

For the 17 years from 1923 to 1940 the total number of medical school graduates each year kept pace quite successfully with the growth in number of internships. Because of the survival of a considerable number of 2-year internships and because of the appearance of a sizable number of graduates of Canadian and other foreign medical schools, as recently as January, 1939,<sup>27</sup> there were only 344 unfilled places among the internships of all the hospitals in the United States. However, over the years from 1940 to 1945, the number of internships increased much faster than the production of medical school graduates (see Table 1). The rapidly growing difficulty the hospitals encountered in filling all their places impelled some of them to try to get ahead of the others by moving the date of internship appointment earlier and earlier in the medical course; first in the senior year and then into the junior year and even earlier. In an effort to prevent these "rushing" tactics from disrupting the orderly process of medical school education, and to allow the students to attain sufficient maturity to make

<sup>26</sup> Hospitals Approved for Residencies in Specialties. J.A.M.A., 88:829, 1927.

<sup>27</sup> J.A.M.A., 114:1170-73, 1940.

wise choices, the Committee on Internships and Residencies of the Association of American Medical Colleges set up a cooperative plan for internship placement, which involved an agreement among the deans of the schools of Medicine, the Council on Medical Education and Hospitals of the A.M.A., and the American, Catholic, and Protestant Hospital Associations, as to a fixed date for appointments during the spring of the senior year. This plan served

to prevent chaos in the transition from medical school to the hospital year of internship. It was in operation until the institution of the more effective Matching Plan,<sup>28, 29</sup> which was introduced in 1951.

<sup>28</sup> Mullin, F. J. Internship Appointments—Matching of Preferences of Students and Hospitals. J.A.M.A., 145:1339-41, 1951.

<sup>29</sup> Mullin, F. J., and Stalnaker, J. M. The Matching Plan for Internship Appointment. J. M. Educ., 26:341-45, 1951.

TABLE 1

RELATION OF NUMBERS OF MEDICAL SCHOOLS, STUDENTS, HOSPITALS, INTERNSHIPS,  
AND RESIDENCIES OVER THE PAST 53 YEARS

Year	No. schools	No. students	No. graduates	No. hospitals	No. internships	No. residencies
1905	160	26,147	5,606	...	...	...
1910	131	21,525	4,440	...	...	...
1915	96	14,891	3,536	...	...	...
1920	85	13,798	3,047	469	2,960	...
1921	83	14,466	3,186	482	2,962	...
1922	81	15,635	2,520	492	3,065	...
1923	80	16,960	3,120	500	3,119	...
1924	79	17,728	3,562	518	3,269	...
1925	80	18,200	3,974	528	3,832	...
1926	79	18,840	3,962	554	4,727	...
1927	80	19,662	4,035	578	4,952	1,776
1928	80	20,545	4,262	611	5,109	...
1929	76	20,878	4,446	624	5,409	1,909
1930	76	21,597	4,565	654	5,531	2,028
1931	76	21,982	4,735	674	6,154	2,139
1932	76	22,135	4,936	696	6,261	2,141
1933	77	22,466	4,895	689	6,204	...
1934	77	22,799	5,035	676	6,204	2,373
1935	77	22,888	5,101	697	6,443	2,564
1936	77	22,564	5,183	705	6,759	2,840
1937	77	22,095	5,377	712	7,167	3,202
1938	77	21,587	5,194	729	7,354	3,499
1939	77	21,302	5,089	734	7,833	4,563
1940	77	21,271	5,097	730	8,182	4,882
1941	77	21,379	5,275	735	8,182	5,256
1942	77	22,031	5,163	740	8,352	5,487
1943	76	22,631	5,223	760	8,180	5,796
1944	77	48,195*	10,303*	766	5,602†	5,393
1945	77	24,028	5,136	785	8,429	7,625
1946	77	23,216	5,826	798	8,584	8,930
1947	77	23,900	6,389	764	8,539	12,003
1948	77	22,739	5,543	807	9,118	15,172
1949	78	23,670	5,094	807	9,124	17,293
1950	79	25,103	5,553	799	9,398	18,669
1951	79	26,186	6,135	828	10,044	19,364
1952	79	27,076	6,080	865	11,467	20,645
1953	79	27,688	6,668	856	11,006	22,292
1954	80	28,227	6,861	844	10,624	23,628
1955	81	28,583	6,977	850	11,048	25,486
1956	82	28,639	6,845	867	11,616	26,516
1957	82	28,852	6,796	852	11,895	28,528
1958	85‡	29,473	6,861	867	12,325	30,595

\* Two classes.

† Quota year.

‡ Includes schools provisionally approved.

That year the Committee on Internships and Residencies of the Association of American Medical Colleges sponsored the organization of the National Inter-Association Committee of Internships which in turn carried the responsibility for the success of the Matching Plan. In addition to the organizations already represented on the Committee on Internships and Residencies, the Inter-Association Committee established liaison with the federal hospital authorities because of the growing size and importance of military internships. Although the Matching Plan could in no way solve the problem of the growing number of unfilled internships, it has been highly successful in giving the senior medical student candidates the fairest possible opportunity to obtain appointments among the three or four hospitals of their highest preference. At the same time, the hospitals have an equal opportunity to select candidates highest on their lists of choice.

The great difficulty created by the sharply rising number of unfilled house staff appointments since 1950 is still with us in unsolved form (Table 1). By 1950, the national total of unfilled internships had risen to over 3,000,<sup>20</sup> and the J.A.M.A.<sup>21</sup> reported 5,000 positions available during the year of 1956-1957 which could not be filled by American graduates. However, by that time, 1,988 interns and 4,741 residents were being accepted from 88 countries abroad to help fill the annual gap. These reinforcements have created new problems because of the difficulty, and in many cases the impossibility, of arriving at an accurate evaluation of the quality of the medical course these foreign graduates had received in their countries, as well as language competence. Because of the undesirability of trying to continue the publication each year in the educational number of the J.A.M.A. of a list of medical schools abroad which are

<sup>20</sup> Approved Internships and Residencies in the United States. J.A.M.A., 147:381-512, 1951.

<sup>21</sup> Annual Report and Directory of Approved Internships and Residencies. J.A.M.A., 165:454, 1957.

considered to be equivalent in their educational standards to those in the United States and Canada, it has been announced that that listing will be discontinued by 1960. The newly formed Educational Council for Foreign Medical Graduates is setting up its world-wide examination system by which graduates of foreign schools may have an opportunity to demonstrate their proficiency in medicine, as well as their command of the English language, before being accepted for appointment to an internship or residency in the United States.

The rapidly growing problem of unfilled internships over recent years has accentuated the competition between the university hospitals and other hospitals for the supply of candidates available. There have been bitter complaints that the former are able to "corner the market" because of their advantage of direct contact with the students. The demand among "non-teaching" hospitals is for rotating interns to insure coverage of all services. In an attempt to increase the supply, an effort was made to force a reduction in the number of approved straight internships, since these are confined almost entirely to university hospitals. Another approach was a move to require a compulsory re-distribution by application of a formula reducing the number of internships in each hospital, where there had been recent growth in numbers. This proved to be unworkable.

The disappearance of the 2-year rotating or mixed internship forced by military restrictions during World War II, and the growth of the residency system, are factors in accentuating the intern supply shortage as it impelled hospitals to double the number of interns sought annually.

Actually the claim that the university hospitals were taking an undue and unjustifiable share of the candidates available was largely due to a misunderstanding. The large increase in the size of university hospital house staffs is principally in the ranks of the residencies.

An excellent review of development and progress as recorded by the Council on

Medical Education and Hospitals of the A.M.A., from 1926-1952, appeared in the J.A.M.A. in 1952.<sup>32</sup>

In 1951 an Advisory Committee on Internships was appointed by the Council on Medical Education and Hospitals to study the place of the internship in medical education and to consider the entire internship problem in its broader aspects. The intent was to learn more about the internships, including such questions as the reasons that influence interns to seek training in some hospitals rather than in others, the influence of internships in determining the location and type of subsequent practice, the number of physicians who take additional training beyond the internship, and other pertinent matters. Questionnaires were sent out to the graduating classes of 1937-1947, and returns were obtained from over 60 per cent of the graduates. A report of these findings was published in the J.A.M.A. in February 7, 1953.<sup>33,34</sup> Revisions of the Essentials of an Approved Internship were officially adopted at that time. These included organization and conduct of the intern educational program, along with the responsibilities of medical staffs and interns. Changes were made in the quantitative requirements relating to bed capacity, annual admissions, and autopsy rate. The provision that a hospital which had failed for 2 successive years to appoint at least two thirds of its requested number of interns be re-evaluated for continued approval was invalidated, revealing another unsuccessful attempt to close the gap between the number of internships offered annually and the supply of graduates to fill them.

In 1954, the Internship Review Committee, composed of representatives from the Council on Medical Education and Hospitals, the Association of American

<sup>32</sup> Editorial: J.A.M.A., 150:418-19, 1952.

<sup>33</sup> Report of the Advisory Committee on Internships to the Council on Medical Education and Hospitals of the American Medical Association. J.A.M.A., 151:499-510, 1953.

<sup>34</sup> Table I. Based on Educational and Internship and Residency Numbers of J.A.M.A.

Medical Colleges, the American Hospital Association, the Federation of State Medical Boards of the United States, and the American Academy of General Practice, began its work reviewing reports of surveys of intern training programs and making recommendations to the Council for appropriate action. It has followed the policy of giving a hospital as much opportunity as possible to correct deficiencies found at survey before approval is actually withdrawn. The hospital is advised concerning the nature of the deficiencies and is encouraged to correct them as quickly as possible.

In contrast to the happy situation in which the American medical graduates find themselves in securing hospital appointments of their choice, the hospitals are vexed with many new difficulties. Even the outstanding hospitals which have enjoyed great internship popularity and prestige, and which only a few years ago were able to select their intern staffs from among a very large number of applicants, today find themselves in a situation almost completely reversed, with the hospital rather than the candidate playing the role of suitor. University hospitals find the competition for outstanding medical school graduates keener than ever before, and some have had the dismaying experience of not being able to obtain enough candidates to fill their quotas! In a few, perhaps, a virtue is made of necessity, with moves to abolish the internship entirely, relying thereafter on fourth-year clerks and assistant residents to perform duties formerly in the domain of the intern. The rising quality of the clerkships and multiplication of residencies has tended to catch the internship in a squeeze from above and below, raising questions as to its approaching vestigial status.

While the growing number of unfilled internships and residencies over recent years has served as a powerful stimulus to the elevation of educational standards, through competition for the supply of graduates available, the annual uncertainty as to success in the competition and trends to increase annual stipends incidental to this

competition have placed new and unpredictable strains upon hospital operations and have played a definite part in the rapidly growing costs of patient care. In fact, the realization is now at hand that the patients can no longer be expected to bear the full costs of educating either interns, residents, or student nurses.

Since the internship and residency with justification now may be characterized as the other half of formal medical education, we have come to the point where it seems no longer justifiable to expect the already financially burdened hospitals and patients to provide for complete financing of hospital resident staff education any more than it is possible for a modern medical school to support its entire operating budget out of medical student tuition fees.

Although the primary educational function of the internships and residencies has been emphasized repeatedly by educational leaders among the medical schools, teaching hospitals, the Association of American Medical Colleges, and the Council on Medical Education and Hospitals of the A.M.A., the essentiality of house staffs in maintaining high service standards, as well as in meeting the vast and growing volume of patient care today, could not be more clearly evident. If the purpose of internships and residencies were purely or entirely educational, it is obvious that hospitals would not have increased their house staff members to the present high levels.

While admittedly the final responsibility for completion of diagnostic studies and appropriate therapy rests with the attending physicians and surgeons, they depend heavily upon their house staffs for many routine tasks in patient care, especially in the larger hospitals. There is conviction that without such services continuity of attention, night and day coverage of patients' needs, comprehensive history taking and physical examination, regular progress notes, narrative summaries, and final diagnoses according to accepted nomenclature cannot be adequately provided.

The fact that over 80 per cent of Ameri-

can hospitals do not have the advantage of internship or residency services and the finding that approximately half of them have failed to attain approval by the Joint Commission on Accreditation are perhaps other evidences of the extent to which house staffs are a factor in meeting minimum requirements for acceptable standards of patient care.

The observation that so often comprehensiveness of case "workup" as far as it is evidenced by record keeping is at its highest point when initiated by the medical student clerk, declines as the physician proceeds through his internship and residency, and finally reaches its nadir when he becomes a practicing physician, bears evidence to the ever-growing pressure to add not only interns and residents to hospital staffs, but medical students earning their way through school by serving as "substitute interns," to complete the essential tasks involved in connection with comprehensive medical care which the visiting physicians either cannot or will not accept. There is clear evidence, too, that the sheer volume of demand by the public for both preventive and curative care, and the growing realization of the need for attention to emotional as well as physical complaints, have become so vast that medical educational activities at all levels are in constant danger of being "drowned in the case load." The temptation to "cut corners" or "skid" in keeping up good standards of record keeping are all too difficult to resist.

Quite obviously the university hospitals and others of comparable resources in the way of salaried faculty members, large house staffs, research laboratories, and a limitation of case load have great advantages in maintaining the system, discipline, and morale necessary to keeping abreast of the latest advances in medicine as applied to the modern needs of the individual patient. Furthermore, such institutions have the added advantages of ample and well integrated nursing, medical social service, and technical, secretarial, and other auxiliary services. Comprehensive medical care, physical

and occupational medicine, and rehabilitation are all becoming accepted parts of essential services in such institutions. It is in environments of this type that most medical students and the more fortunate interns and residents spend their undergraduate and graduate years, but the great majority will spend their professional lives under conditions varying widely from the university hospital ideal.

Recent studies of nursing activities reveal the extent to which doctors in private practice, because of the growing pressures of patients' demands, have felt forced to delegate to nurses responsibilities formerly within the sacred domain of the physician. In hospitals without interns or residents this applies not only to the watching of the progress of obstetrical labor, for example, but such responsibilities as giving infusions or even transfusions to critically ill patients, and the taking and recording of medical histories! The latter delegation appears to be a ready transfer of procedure from the doctor's private office, where the office nurse is expected to obtain historical data while the patients await their turn to see the doctor.

*Full-time directors of medical education in non-University hospitals and the "yo-yo" relationships.*—Since full-time leadership among medical faculties, on the clinical as well as the basic science services, has become one of the essential ingredients in the operation of a good medical school, it is increasingly obvious that the same principle applies in some degree to the "other half" of medical education during the internship and residency. A growing number of nonuniversity-affiliated hospitals have been introducing such full-time teachers, either as directors or coordinators of the teaching and research activities. Wherever possible, co-operative arrangements are encouraged between such a preceptor, his medical and house staffs, and a neighboring university center. Someone has characterized this concept as the "yo-yo system," resembling the toy top which oscillates back and forth. A reinforcement of this arrangement has been to rotate residents, interns, and student

clerks between the university centers and outlying hospitals for the mutual benefit derived. Notable examples are arrangements with regional hospitals sponsored by the Bingham Associates Fund through Tufts University School of Medicine and the New England Center Hospital; the New York University-Bellevue Medical Center; the University of Rochester and its associated hospitals; the University of Wisconsin School of Medicine and the Wisconsin General University Hospital; the University of Kansas and its University Hospital; the University of Colorado and its two associated teaching hospitals; the Medical College of Virginia; and a number of others.

*"Mountain peaks" of medical education versus the "foothills and plains."*—Perhaps it is fair to characterize the first half of the 20th century beginning with the trail blazing at Harvard, Johns Hopkins, and Michigan Universities and the spectacular results, subsequent to the Flexner survey, as the era when attention was concentrated on raising of the medical "mountain peaks" in strategic locations throughout the country as centers of radiating influence to other medical schools and less fortunate communities. The hope was that other "peaks" would arise and the level of medical education would be elevated generally. An illustration of how recently these "peaks" have come into being is the recollection that in 1923 none of the great medical centers which today occupy such commanding positions in New York City was then in existence.

To avoid the dangers of these eminences becoming "ivory towers" in splendid isolation there is now a concerted drive by medical leadership supported by private philanthropy and the great foundations and reinforced by Hill-Burton funds, to raise the height of the lesser "peaks" and to set up centers of medical excellence on the medical "plains" where the larger part of medical care to the population is rendered. Again we should remind ourselves that over 80 per cent of the hospitals in the United States do not have either interns or residents. Since the production of physicians is not keeping

up with the increase in population, serious attention must be devoted by all concerned to devising ways and means of more efficient use of available medical and paramedical manpower.

The most recent approach to the evaluation of current trends in house staff education is being conducted by the New York Committee for the Study of Hospital Internships and Residencies.<sup>13</sup> This follows a series of studies since 1934 "to formulate criteria for evaluating the adequacy of internship and residency programs and to identify which aspects of these programs may foster or curb achievement of desirable educational objectives." The first comprehensive report was published in 1938.<sup>12</sup>

In 1957 "an exploratory sociological analysis of the nature of the internship and the range of problems which appear to be related to this period of training" was proposed. This entailed "concern with the social process through which the novice student is transformed into a mature physician." Financed by a grant from the Commonwealth Fund, this study was launched in 1958. Early in 1959 an elaborate questionnaire was sent to 1,400 graduates of

Cornell, Pennsylvania, and Western Reserve medical schools to obtain an evaluation of the adequacy of their internship and residency experiences. Much is to be expected from these new approaches.

It is obvious that much more concentration of attention, leadership, and financial support of hospital internships and residencies located outside the zone of immediate university influence and educational direction will be the pressing task for the years ahead. Unless the levels of performance there can be sustained at an approximation to those of the great medical centers there is a paradox in holding medical students to the standards required in an academic environment, while at the same time anticipating varying degrees of compromise among internships, residencies, and in practice elsewhere. It would appear that the outstanding medical task for the remainder of the 20th century will be to foster centers of medical excellence in strategically located hospitals in all American communities. These areas must face the great challenge of providing hospital-centered communitywide programs of preventive, curative, and restorative medicine in villages, towns, and cities, with or without interns or residents.

<sup>13</sup> Reader, George G., and Falaguerra, Theresa E., *Study of the Internship*. *The Journal of Medical Education*, Vol. 34, No. 2, pp. 127-33, Feb. 1959.

## William Pepper, 1843-1898: Physician, Educator, Philanthropist

FRED B. ROGERS, M.D.

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Dr. William Pepper, a versatile physician of lofty vision and great energy, deserves to be remembered as one of the foremost leaders in American medical education. As Professor of Medicine and Provost of the University of Pennsylvania, his career testified to his preference for "the life of the salmon to that of the turtle." He was a pioneer in the reform of medical instruction toward the end of the 19th century. In the sense of training a student to make use of his own mind as a substitute for blind acceptance of dogma, Pepper—in Philadelphia—actually preceded Eliot at Harvard and Billings, Welch and Osler at Johns Hopkins, in placing medical teaching in a true university setting. Pepper, busily "swimming upstream" during his relatively short, crowded life, accomplished important results in raising standards and improving methods of medical education, practically rebuilding his *alma mater*, as well as being responsible for such civic improvements as the city museums and the free library. A foremost Philadelphian of his time, in the tradition of Benjamin Franklin and Stephen Girard, William Pepper is particularly worthy of recall for his lasting contributions to medical education. His long struggle for educational reforms inspired two celebrated addresses which are classics in the field of the medical profession and its relation to the public. It is appropriate now, 60 years after his death, to recall the man and re-evaluate his contributions, which have benefited so many during and since his lifetime.

William Pepper was born in Philadelphia on August 21, 1843, into a family of culture and wealth. He was a grandson of George Pepper, Philadelphia merchant, and son of Dr. William Pepper, one of the foremost



*William Pepper*  
R.T. 44

DR. WILLIAM PEPPER IN 1887

American physicians of the mid-nineteenth century. Sarah Platt, mother of William Pepper, came of a New Jersey Quaker family. When her husband died early, she proved a capable guide to their seven children, of whom two, George and William, became physicians.

William entered the University of Pennsylvania, at the age of 15, in 1858; 4 years later he graduated, second in his class. In 1862 he entered the medical school, graduating 2 years later, when he was 21 years old. He subsequently served 1 year as resident physician at the Pennsylvania Hospital, and soon afterward was appointed

## HIGHER MEDICAL EDUCATION,

### THE TRUE INTEREST OF THE PUBLIC AND OF THE PROFESSION.

TWO ADDRESSES DELIVERED BEFORE THE MEDICAL  
DEPARTMENT OF THE UNIVERSITY OF PENN-  
SYLVANIA ON OCTOBER 1, 1877, AND  
OCTOBER 2, 1893.

BY  
WILLIAM PEPPER, M.D., LL.D.

PHILADELPHIA:  
J. B. LIPPINCOTT COMPANY.  
1894.

TITLE-PAGE OF WILLIAM PEPPER'S  
*Higher Medical Education*, 1894

pathologist and visiting physician to this hospital. He later held similar posts at the Philadelphia Hospital, Blockley.

In 1868 he received his initial faculty appointment at the University of Pennsylvania—as lecturer in pathology at the medical school, and 2 years later was named to a similar post in clinical medicine. These appointments began 30 years of dedicated service to the university.

William Pepper spent several months in Europe in 1871, visiting leading medical centers and laying the foundation for his future development as a medical leader and broad-visioned educator. Upon his return, he initiated the novel project of establishing a teaching hospital in connection with the university medical school. A planning committee was formed, with the 27-year-old physician as its most active member. Large-ly because of Pepper's energy and enthusiasm, the Hospital of the University of Pennsylvania opened its doors on June 4, 1874, with the medical school faculty as its staff. During the rest of his life, Pepper labored for the development of this hospital. In 1887 he founded the nurses' training school, and in 1894, as a memorial to his father, he established and endowed the William Pepper Laboratory of Clinical Medicine, the first laboratory in the United States devoted to the investigation of clinical pathology. During the '70's and '80's, Pepper had cast early votes for the support of medical research—then an unusual feature in medical school programs. He had already effectively used his professional position to secure gifts for research projects at the University during this period.

In 1875 he was appointed medical director of the Centennial Exhibition to be held at Philadelphia in the following year. A model hospital was erected on the exhibition site, where problems of hygiene and sanitation were solved under his supervision. The British and Norwegian governments decorated him for this outstanding service.

In 1876 he was elected to the newly created chair of Clinical Medicine. On October 1, 1877, as an introduction to his course of clinical lectures, he delivered a notable address, "Higher Medical Education, the True Interest of the Public and the Profession." Reviewing the methods of medical instruction at home and abroad, this address pointed out the deficiencies then prevalent in American medical education and suggested corrections for the American schools. Together with the efforts of President Eliot at Harvard, Pepper's report,

published by the trustees of the University of Pennsylvania, paved the way for drastic reforms in American medical education. After abolition of the former short-term, lecture-fee system, a 3 years' graded course was introduced in the medical department at Pennsylvania in 1877. This innovation was later followed by Syracuse (1877), Michigan (1880), and other institutions. Unlike the founders of the Johns Hopkins school later, Pepper waged a heroic struggle against traditional forces in effecting sweeping innovations at Philadelphia.

In 1880, William Pepper began his 14-year tenure as Provost of the University of Pennsylvania—a period which saw this institution, by unification of various faculties and additions of new departments, rise from local to national pre-eminence. Lafayette College, in 1881, awarded him an honorary Doctor of Laws degree in recognition of his service to medical education. In 1884, Pepper was elected professor of the theory and practice of medicine, succeeding to the chair vacated by his father 20 years before. Into his own vacated clinical chair came a young Canadian, William Osler, who claimed Pepper as a friend during the former's 5-year stay in Philadelphia, and who later paid high tribute to his former colleague at the time of Pepper's death.

William Pepper was an outstanding medical practitioner, writer, and teacher. His great capacity for work, intellectual vigor, and ability to attract and enlist influential citizens to his side raised him high in professional affairs. In 1884 he was a founder, and 2 years later, president, of the American Climatological Society. In 1886 he was an organizer of the Association of American Physicians, and he served as its president in 1891. Also, in 1886, Pepper headed the American Clinical Association and later was a member of the executive committee of the American Medical Association. In 1893, as president of the first Pan-American Medical Congress, he did much to promote international friendship among professional colleagues in the Americas.

In addition to a busy teaching schedule

and consulting practice, William Pepper published many reports on medical topics and edited several textbooks. In one early paper, *The Morphological Changes of the Blood in Malarial Fever* (1867), prepared in collaboration with Edward Rhoads and John Forsyth Meigs, he described the pigmented bodies in the erythrocytes, which Laveran later (1880) demonstrated to be the malarial parasites. In a significant con-



STATUE OF DR. WILLIAM PEPPER, UNIVERSITY OF PENNSYLVANIA CAMPUS

tribution on "progressive pernicious anemia" (*Am. J. M. Sc.*, 70:313-47, 1875), Pepper was the first to call attention to the hyperplastic bone marrow in this disease. He was especially interested in the treatment of pulmonary tuberculosis and wrote a monograph on this subject: *The Climatological Study of Phthisis in Pennsylvania, 1887*.

In 1869 Pepper published a *Descriptive Catalogue of the Pathological Museum of the Pennsylvania Hospital*, and subsequently edited several early volumes of the *Transactions* of the Philadelphia Pathological

Society. He also edited the first twelve numbers of a successful periodical, *The Philadelphia Medical Times*, first published in 1870. In the field of pediatrics, Pepper produced a fourth, revised edition of *A Practical Treatise on the Diseases of Children* by John Forsyth Meigs (1870). He edited *A System of Practical Medicine* (5 volumes, 1893-94). An interest in medical history was also apparent in his biographical sketches of Benjamin Rush and Daniel Drake.

Pepper's fame, however, rests securely on his two addresses on medical education. The first, already mentioned, ushered in reforms in 1877. The second, bearing the same title, was delivered on October 2, 1893, 16 years later, at a similar epoch-making occasion. The 1893 address inaugurated a 4 years' medical course and further rearrangement of the curriculum at the University of Pennsylvania. These two reports, published in a single volume in 1894, remain a signal American document on medical education. In 100 pages, which include three appendices giving actual data on American and foreign medical schools in 1877 and 1893, Pepper reviewed the best medical instruction at that time and urged loftier goals for future accomplishment. Describing this book shortly after Pepper's death, William Osler said: "The most satisfactory single piece of work in Dr. Pepper's life . . . [was] that which related to the promotion of higher medical education. This little volume . . . represents a forecast and a retrospect. . . . It was always a source of great gratification to Pepper to feel that the plans for which he had worked so hard had been crowned with such success. Years hence these two addresses, with their appendices, will be regarded as perhaps the most valuable single contribution to the literature of the phenomenal educational movement . . . during the last quarter of the nineteenth century."

In 1880, William Pepper was called upon to undertake the administrative direction of the entire university as its provost, in addition to his professorship of medicine and his private practice. During the next

14 years as provost, he accomplished a phenomenal expansion of the university and its resources. He obtained additional land from the city of Philadelphia by arranging for scholarships to local high school graduates and reorganized the faculties and curricula of the College, the Dental School, the Law School, and the Towne Scientific School.

During this time he also concerned himself with the founding of the Wharton School of Finance and Economy, the Veterinary School, and additions to the University Hospital. A library was built, and a biological school for premedical and related studies and a department of physical education were inaugurated. In 1892, an independent institute of hygiene was established, headed initially by Dr. John Shaw Billings (who had also been the first director of the University Hospital in 1874). The necessary funds were provided by the wealthy publisher-historian, Henry C. Lea, and the institute was equipped with research laboratories from the start. The death of the provost's uncle, George S. Pepper, in 1890, had previously brought, through his nephew's request, an endowment for a professorship of hygiene which continues to this day.

Other university accomplishments during Pepper's provostship were the Wistar Institute of Anatomy and Biology, a School of Architecture, the Department of Archaeology and Palaeontology, the Graduate School of Philosophy, and a Graduate Department for Women. In addition, he had introduced University Extension Lectures by the faculty and other scholars and had supported archaeological expeditions in this country and abroad. Aside from his university duties, he had founded (1886) the College Association of Pennsylvania, forerunner of today's Association of Colleges and Secondary Schools of the Middle Atlantic States.

By 1894, when he resigned as provost, William Pepper had raised the University of Pennsylvania from a loosely organized group of schools to a unified institution eminent in the academic world. A seated

bronze statue of Dr. Pepper, by Karl Bitter, subscribed by devoted friends and colleagues in 1894, was dedicated posthumously 5 years later. A tablet on the pedestal of this statue today lists the university departments and public institutions in the city which he created. The inscription on this tablet concludes with this prophetic message: "You and I must pass away but these things will last."

Aside from his professional and university interests, Pepper promoted numerous projects for the civic betterment and cultural elevation of his native city. The death of his uncle, George S. Pepper, revealed a bequest of \$250,000 to found a Free Library in Philadelphia. William Pepper directed the distribution of his money to develop a library capable of unlimited expansion. A copy of Karl Bitter's statue of William Pepper today guards the central stairway of the Free Library of Philadelphia—a deserved tribute to a remarkable public benefactor.

In his last years Pepper also promoted the cause of the Philadelphia Museums. The present Commercial Museum and the Free Museum of Science and Art resulted from his visionary efforts.

William Pepper married Frances Sergeant Perry, a great-granddaughter of Benjamin Franklin, in 1873. To Pepper and his wife were born four sons, three of whom lived to maturity and graced the family name. Of his sons, Dr. William Pepper became long-time Dean of the medical school, and Dr. O. H. Perry Pepper, distinguished professor of medicine at the University of Pennsylvania.

To few men has it been given to accomplish so much in so many fields of endeavor in a relatively short lifetime. William Pepper's genius for overcoming obstacles, adjusting to difficulties, and utilizing men gave him victory in many varied projects. One of these accomplishments, his position as a leader in American medical education, is secure. Exhausted by an overstrenuous career, Dr. Pepper developed anginal heart disease during the last 5 years of his life

and suffered much from this malady before his death on July 28, 1898. He died at Pleasanton, California, while on a trip taken in hope of recovering from his illness.

Recalling "five years of pleasant fellowship in Philadelphia," shortly after Pepper's death, his colleague, William Osler, aptly described William Pepper, the man:

In *Rugby Chapel*, that noble poem in memory of his father, Matthew Arnold draws a strong contrast, on the one hand, between the average man, who eddies about, eats and drinks, chatters and loves and hates—and then dies, having striven blindly and achieved nothing; and, on the other, the strong soul tempered with fire, not like the man of the crowd, but fervent, heroic and good, the helper and friend of mankind. Dr. William Pepper . . . belonged to this group of strong souls, our leaders and masters, the men who make progress possible . . . the leader who sees ahead of his generation, but who has the sense to walk and work in it.

#### ACKNOWLEDGMENT

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## Private Giving and the Developing Crisis in Medical Education

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National Fund for Medical Education; and Chas. Pfizer & Co., Inc., New York, N.Y.

At what point does voluntary corporate giving cease being philanthropy and become a necessary and eminently wise investment in the self-interest of business and industry? For the drug and pharmaceutical industry in particular—and for the American economy generally—that point of no return may have already been reached insofar as private support for medical education is concerned.

There has been, in recent years, encouraging evidence that corporate managers are aware of their enlarged responsibility to support health, education, and welfare projects. In his annual report to contributors, S. Sloan Colt, President of the National Fund for Medical Education, points out that corporation giving in these fields has risen from \$214,000,000 in 1946 to an estimated \$525,000,000 in 1958. Of this total, some \$150,000,000 is for corporate aid-to-education programs. The National Fund itself has distributed \$19,000,000 in unrestricted grants to the nation's 83 medical schools since the initial awards were made in 1951.

The Drug and Pharmaceutical Division of NFME reported contributions of \$228,355 in 1958, increasing the over-all division total to \$1,255,505 since its inception in 1953. Gifts from the nation's doctors in 1958, through the American Medical Education Foundation and directly to medical schools, totaled slightly over \$4,000,000.

(In addition to direct cash gifts, the phar-

maceutical industry has responded to the growing need for private support of medical education by authorizing grants of approximately \$20,500,000 for various fellowships, individual financial aid, and specified research projects during 1958.)

Despite these substantial outlays, and matching grants from the Ford Foundation which enabled the Fund to earmark \$3,000,180 for medical education last year, there is growing concern with the basic concept of private support for medical education and of its capacity to handle the job.

Inevitably, the problem of providing adequate support for medical research and education had to assume gigantic proportions. This is the cost of our penchant for progress. In a nation whose population is expected to reach 230,000,000 by 1975, enormous pressure was bound to come to bear on medical schools to graduate more doctors without sacrifice to our traditionally high standards.

Mobilization of additional private income for medical education has been made imperative by the unprecedented accomplishments of medical science itself, by the changing pattern and broader demands of modern medical care, and by the increased urbanization and industrialization of our society. All these elements account in some measure for the note of urgency in the current appeal to members of the pharmaceutical industry on behalf of the National Fund which calls attention to some disquieting facts, among them a lack of adequate financial resources which is making it increasingly difficult for

\* President, Charles Pfizer & Co., Inc., N.Y.; and Chairman, The Drug and Pharmaceutical Div., Nat. Fund for Medical Education.

the medical schools to attract and retain competent faculty.

The Council on Medical Education has found that our 83 medical schools are confronted with a most serious teacher shortage which is, unfortunately, steadily increasing. In 1957, there were 331 faculty vacancies, while in 1958 these unfilled positions climbed 86 per cent to 619.

This faculty shortage, caused mainly by budgetary stringencies, cannot be permitted to continue. It imperils the education of our entire oncoming generation of physicians and if unabated may very well check the advance of the health sciences. Manifestly then, it behooves the pharmaceutical industry to contribute toward a remedy for this situation as quickly as possible.

No one will seriously question the formidable debt we owe the medical schools for supplying our doctors and for creating a climate conducive to the original research which is both a wellspring of new medical discoveries and an indispensable phase of the teaching function.

By its very nature, medical training is a most expensive type of education. Estimated cost per student per year is \$4,000, with tuitions accounting for less than a fifth of this amount. Up 86 per cent in the past decade, tuitions probably can go no higher without slamming the door on medical careers for thousands of young men and women. The situation, ironically enough, is made more acute by the relentless progress of scientific research which adds to the teaching load and to educational costs as it blazes new trails.

Techniques in medical education have undergone radical change in the past decade. Unlike the medical school of yesteryear in which a single lecturer was sufficient for hundreds of students, today's classes are small, the ratio of teachers to students much higher, equipment is advanced and expensive, and students spend much of their time "learning by doing" in the laboratories.

Nowhere is the present crisis more evident, however, than in the flight of medical educators to greener pastures at a time

when they are most urgently needed in our universities. This problem, deeply rooted in salary budgets, must be met head-on if we are to keep the healthy balance of tax funds and private contributions which enables our schools to maintain the academic flexibility needed for continued progress.

While the \$170,000,000 earmarked for research by the pharmaceutical industry in 1958 (expected to approximate \$190,000,000 in 1959) has made available new and better drugs for greater numbers of people, it has also placed new demands on medical education. As pointed out by the Pharmaceutical Manufacturers Association in its Statement of Principles on Government Support of Medical Research, "The future of such efforts is intimately linked to the basic research and training carried on by the Nation's academic institutions."

The PMA's Statement of Principle merits further attention, corroborating as it does the key points and recommendations made by the Consultants Committee on Medical Research and Education to the Department of Health, Education, and Welfare—known more succinctly as the Bayne-Jones Report.

The Committee, headed by Dr. Stanhope Bayne-Jones, formerly Dean of the Yale University School of Medicine and President of the Joint Administrative Board of the New York Hospital-Cornell Medical Center, submitted its report on June 27, 1958. At that time, in its general findings concerning the "fundamentals of the relationship between the public, the Federal government, science and higher education," several danger signals were flashed. Prominent among them was the tightening squeeze on medical manpower.

The Bayne-Jones consultants warned that unless funds are "made available for present medical schools it will not only be difficult to increase the number of graduates but it will be almost impossible to provide faculties for any new medical schools. Outside (non-university) support for the operating expenses of medical schools during recent years from private sources has

amounted to millions of dollars per year and not the tens of millions of dollars per year required for optimum performance today and future expansion during the next decade."

Noting a phenomenal rise in government support to medical research from \$3 million in 1940 to an estimated \$227 million in 1958, the Committee envisions still further expansion of Federal aid "because the total prospective funds from all non-Federal sources combined do not appear to be adequate to finance expanding requirements."

Furthermore, while the consultants on medical research and education acknowledge that the "field of medical education and research supported thus far by the Federal Government are proper fields for support," they also call attention to the dangers inherent in Federal support. Specifically cited is the likelihood that "dependence upon Federal funds will lead to various kinds and degrees of Federal control over individuals and institutions."

The consultants observe, wisely it seems, that a diversity of sources is desirable "not only for financial reasons but also because a democratic society depends upon general understanding of important goals and upon the free participation of private citizens in the attainment of these goals." In the same breath, however, we are forewarned that "unless there is a marked change in social philosophy leading to private gifts or State appropriations on an unprecedented scale, large Federal appropriations will be required."

Certainly it is irrefutable that the modern physician can practice the healing art on more patients in far less time. Yet the Bayne-Jones Report takes cognizance of the fact that the increased scope and efficiency attributable to improved techniques and new drugs is largely offset by an explosive population which increases by nearly 3 million persons a year—all of whom "see the doctor" more frequently. Simply to maintain the present ratio of doctors to population—one to every 730 persons—we will

need some 315,000 doctors by 1975 as contrasted with the 225,000 we now have.

Currently, the excess of new doctors over deaths and retirements is about 3,000. New schools just entering operation or well into construction are expected to bring the rate of increase up to 3,500 a year, enough to supply roughly two-thirds of the need. According to Dr. Vernon W. Lippard, Dean of the Yale University Medical School, 2,000 additional medical school graduates a year will be required to maintain the present ratio of physicians. Since the graduating class of a medium-size school is around 80 individuals, the equivalent of 25 more schools will soon be necessary.

To what purpose new schools, however, if the compelling need for learned teachers to impart whole new worlds of medical knowledge cannot be met? Medical schools must be enabled to cope financially with these competitive areas which siphon off medical teaching power.

Mr. Colt, Chairman of the National Fund for Medical Education, recently remarked in an address to the Dallas County Medical Society that Fund grants have in many instances been used to supplement salaries and thus retain valuable teachers. He quickly added, however, that the amounts are "only a drop in the bucket" and that much more is needed.

Precisely how much more is a moot question. The Bayne-Jones estimate—and a conservative one—is from \$10,000,000 to \$20,000,000 per year if the medical schools are to attain optimum standards of education, research, and community service.

The progress of the National Fund for Medical Education has been slow but steady. In 1950 there were just fifteen contributing companies. Today there are 1,946. With each passing year more business leaders serve as members of the Fund's Committee of American Industry. By their diligent voluntary efforts they have shown complete accord with these Fund objectives:

To strengthen the nation's ability to sur-

vive by training a sufficient corps of skilled men and women to care for the people's health and medical needs . . . To interpret the needs of medical education to the American public . . . To encourage the development and advancement of constantly improving standards of medical education . . . To preserve academic freedom for medical

education.

Demonstrably, however, unless private support is forthcoming at a swifter and more realistic pace, we will continue to hear clamor for the movement of more government into a vacuum which will have been created by the apparent nonchalance of industry in the face of developing crisis.

## Report on the Use of Closed-Circuit Television in the Teaching of Pharmacology

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The staff of this department has been using closed-circuit television as an aid in the laboratory teaching of medical, dental, and pharmacy students. The use of this technique was prompted by the impending necessity to replace the student laboratory equipment (largely constructed in our machine shop in the 1920's). The rapidly chang-

tal methods. This report describes our experience with this teaching aid.

Our present laboratory course consists basically of a series of demonstrations. Closed-circuit television is utilized to provide adequate student visualization. This course evolved from many prolonged discussions about the role of the laboratory in the



FIG. 1.—General view of demonstration room

ing trends of research methodology in pharmacology make it extremely difficult to choose suitable replacement equipment that will serve for future years. Therefore, this method of teaching, which allows the student laboratory to be conducted with only one set of apparatus, appears particularly flexible with regard to changing experimen-

undergraduate teaching of pharmacology. Our previous laboratory was similar to that in many other pharmacology departments. All possible operative and set-up procedures were performed by the staff of the department in advance of the students' arrival in the laboratory. The purpose of this procedure was to maximize the time spent in ob-

serving and understanding drug actions, i.e., pharmacology. After a brief introductory conference acquainting the students with the exercise, its methodology, etc., they were dispersed in groups of four to six students. The staff was available at all times to assist and to answer questions. Following the exercise, a discussion was held to correlate, clarify, and summarize the results of the several groups.

The relative merit of this procedure as contrasted with other types of laboratory courses is not the subject of this report. Our present purpose is, however, to point out that such a laboratory course is, in fact, a series of demonstrations performed by the students. In this light, an alternative to such a laboratory course is the substitution of staff demonstrations for student demonstrations. A primary disadvantage of this procedure is the lack of visual contact between the student and the demonstration. This disadvantage can, in our opinion, be adequately met by the use of closed-circuit television.

The demonstrations are held in a classroom  $27 \times 28$  feet with seats for 60 students. The demonstrations are repeated to accommodate 120 medical students. The pharmacy and dental classes have fewer than 60 students each, so that one demonstration suffices for each class. The exercise is conducted in the same room with the student so that direct vision is possible but greatly inferior to the view provided by the television screen. The staff member lecturing a given topic is in charge of the demonstration and supervises the conduct of the exercise so that it correlates with his discussion. This allows him to halt the demonstration to answer questions posed by students or to repeat portions of the demonstration as the need arises. Our present equipment has adequate light sensitivity so that the ordinary lighting in the room is left on continuously; thus, the students can take notes at any time without discomfort. We utilize two separate camera-viewer systems. Prior to the start of class the cameras are adjusted, usually one on the record and one on

the preparation. During the course of the demonstration no adjustments are needed, and the area viewed by each is not changed so that the equipment itself is relatively unobtrusive. Since more than one preparation is generally utilized during the course of a single laboratory period, the demonstrations are prepared on wheeled carts in an adjacent room. The students are given a 5-10-minute break during the changing of preparations; at the end of the break the next demonstration is ready to begin, with all adjustments of the television equipment accomplished. Technically, the equipment is somewhat less complex to operate than an ordinary television set and home movie camera. Except for the novelty of the first exposure, the equipment did not appear to distract the students' attention from the purpose of the demonstration. Our present laboratory course consists entirely of these demonstrations, with the addition of two exercises in which the students serve as subjects.

The closed-circuit television equipment utilized in this department is illustrated in the accompanying photograph. The system consists of two cameras, two camera control units, and two 21-inch monitors. The considerations which governed the choice of the present equipment were based on the need for simplicity of operation. The much higher initial cost of color and its increased complexity dictated the use of a black and white system. The present equipment appears adequate for our purpose. Very large changes in ambient lighting are automatically compensated, and the sensitivity is sufficient to permit the use of a fairly high lens "f" number so that a reasonable depth of field is obtained. The automatic sensitivity control has the further advantage that the vidicon camera pickup tube is protected from damage which, in other systems, occurs as a result of maladjustment of the camera controls. The individual items were selected from the Kin-Tel "automatic" closed-circuit industrial television system. Standard 16-mm. "c" mount cinematographic lenses of appropriate field of view are used. For special purposes these can be readily inter-

changed. The brackets holding the cameras were designed by Mr. Jack Walters and are shown schematically in Chart 1. The total cost of the equipment including the necessary shop work was approximately \$8000.<sup>1</sup> A portion of this outlay is recovered by the

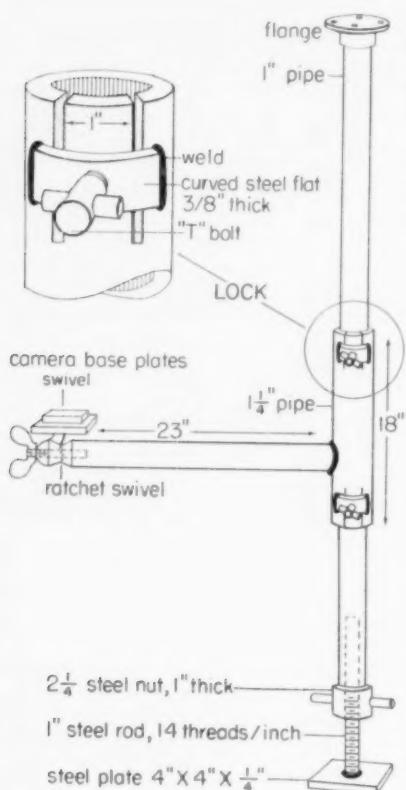


CHART 1.—Schematic drawing of bracket for T.V. cameras.

decreased cost of animals utilized in the laboratory. Contrary to our expectation, the staff time in the teaching laboratory is relatively unchanged—in fact, initially it was greatly increased.

<sup>1</sup> We wish to thank the Upjohn Company for the generous grant which defrayed the major portion of this cost.

The visual magnification provided by the television system allows each student to "see" the demonstration. Often his view by this means is superior to that obtained by the demonstrators watching the preparation. Further, the complexity of the demonstrations with regard to the biological preparation and recording apparatus is limited only by staff competence and availability of equipment. In other respects these demonstrations differ little from those performed without television.

Several of the demonstrations conducted during the past year in which the closed-circuit television equipment seemed particularly advantageous are described below. These specific demonstrations were selected, since without television they are particularly difficult to utilize effectively for a large class of students.

a) Effect of drugs on the isolated rabbit heart preparation of Langendorff: The camera trained on the isolated heart recorded a rabbit heart approximately 12" high on the monitor, and such phenomena as the dissociation of auricles and ventricles during digitalis toxicity were clearly visible.

b) Localization of site of action of ganglionic blocking agents utilizing pre- and post-ganglionic sympathetic stimulation in the cat: Previously, we have used the contractions of the nictitating membrane as the indicator of both chemical and electrical activity; however, with the television system it was easy to use the pupillary changes instead. The pupil, for demonstration purposes, is much superior to the nictitating membrane, since it reacts much more rapidly to stimulation and returns to control more rapidly when stimulation is ended.

c) Effects of quinidine on the driven dog heart: The ventricular electrogram was displayed on a standard cathode ray oscilloscope and one camera utilized to magnify this trace to the television screen. The "driving" stimulus was used to trigger the oscilloscope trace so that the electrical signs of ventricular activity appeared on the screen in the same spot. The slowing of conduction velocity was readily apparent from the

movement of the trace across the tube face. The effects of quinidine on the arrhythmias produced by ligation of the descending coronary artery according to the procedure of Harris were also clearly evident to all students when the camera was utilized to monitor the electrocardiogram recorded on a polygraph.

*d)* The standard tests for anticonvulsant activity in mice are readily demonstrated, since the individual mouse is easily seen on the screen.

*e)* The records derived from various types of transducer-electronic amplifier pen writer systems were displayed in most demonstrations. Blood pressure traces, electrocardiograms, and electroencephalograms, for example, are all readily visible.

We have no objective evidence of the degree of success or failure of the venture. Student attendance of laboratory exercises (which has never been compulsory) has improved markedly. Student interest in pharmacology may have improved. Goldstein has reported that project failure has an adverse effect on student performance. Our general impression of better examination

scores by our present class in comparison to previous ones may indicate the converse of this effect, particularly since other basic science departments do not consider these present students to be superior to previous classes. Students volunteered many favorable comments about the laboratory as a demonstration course. Unfortunately, one must wonder how much of this favor derives from the decrease in time involved (i.e., 1½ hours for demonstrations vs. 3-hour periods previously used). Our impressions of enthusiastic success are tempered by noting that initial enthusiasm has been expressed with regard to many ventures in teaching. At present, however, we feel this method of laboratory instruction is definitely superior to our previous effort.

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# Teaching Undergraduate Clinical Pediatrics

## The Use of Supplementary Study-Project Techniques\*

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In 1953 a contract was negotiated with the city of Nashville providing Hubbard Hospital, the clinical teaching facility of Meharry Medical College, for the first time with an arrangement for reimbursement for medical services rendered the Nashville indigent sick. This supplied a generous influx of clinical materials for teaching purposes never before available.

ROUTINE CLINICAL ACTIVITIES  
INITIATED SPONTANEOUSLY BY STUDENT\*

Clinical History  
Physical Examination  
Routine Laboratory Procedures  
Routine Skin Tests  
Progress Notes

\* This program was followed prior to development of supplementary projects.

CHART 1

Prior to this time, because of the extreme shortage of in-patient teaching cases on the pediatric wards, it was deemed necessary for compensatory purposes to develop ap-

\* Read before the Committee on Medical Education (District IV) of the American Academy of Pediatrics on March 20, 1959, at Meharry Medical College, Nashville, Tennessee.

The teaching program in Pediatrics has been supported by grants from the National Foundation (formerly the National Foundation for Infantile Paralysis, Inc.).

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‡ Instructor in Pediatrics.

§ Assistant Professor of Pediatrics.

propriate techniques to induce junior medical clerks to study more intensively those patients which were available. Conventional clinical teaching methods were already in use. These, of course, involved the usual routine clinical activities initiated spontaneously by students (Chart 1) plus ward rounds, small group conferences, grand rounds, and seminars.

Although these teaching procedures prove as valuable today as they did then, we felt that they were not sufficiently challenging to our students under the handicap of a severely restricted patient load.

### METHODS

*The Clinical Case-study Project.*—The supplements to the basic clinical teaching program for junior medical clerks were developed along the lines of study projects (Chart 2), and the first to be undertaken was the "Clinical Case-study Project." This plan operates as follows:

Three junior medical clerks, working together, select one of their assigned cases as the basis for a clinical case survey. If, for example, it happens to be a case of rheumatic myocarditis, these students are required to report to the hospital record library and make a study of all cases of rheumatic myocarditis in children admitted to Hubbard Hospital for a specified period of time, perhaps during the past 5 or 10 years. One aspect of the study upon which

special emphasis has been placed is that students are urged to imagine that rheumatic myocarditis, for example, has never been described before in the annals of medicine. They must therefore depend primarily upon the clinical, laboratory, and special findings culled from the case records reviewed as a basis for the development of the characteristic features of the disease syndrome under consideration. This has proved to be a productive and provocative enterprise, and it has held both student and

clinical Case-Study Project had been in progress for about 1 year, we decided that it could be substantially enhanced if some attention were given to the visual aspects of the various entities studied. Forthwith, glass-paneled display cabinets were installed along the walls of the hallway leading to the pediatric wards, and plans were initiated for development of the Scientific Exhibit Project. Participation in this project is elective, and the level of response has always been high enough to require a waiting list for use

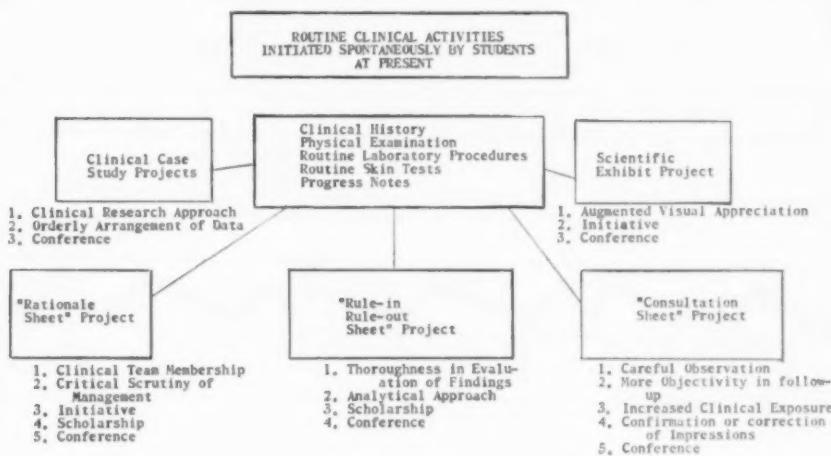


CHART 2

faculty interest at an encouragingly high level. Students engaging in this work are required to write up their findings in a style generally acceptable for publication, with tables, charts, references, and any other supplementary materials considered appropriate or relevant. Later, each group is given a 20-minute period for presentation of its manuscript to the junior medical class as a whole, with ample time available for questions and discussion. Members of the Pediatric staff audit these presentations, participate in the discussion, and after reading the manuscript each offers an independent grade for the work.

*The Scientific Exhibit Project.*—When the

of the cabinets. These exhibits are developed by the same three junior medical students working jointly, with materials and space provided by the department. Data from the clinical case survey, previously mentioned, are used as a basis for development of exhibits. Students obtain a great deal of help through drug houses who generously supply supplementary visual materials without cost. Because students spent so much time in developing these scientific exhibits and because so much enthusiasm was engendered by the natural spirit of competition which evolved, we thought it well to offer prizes to the three groups producing the best exhibits. The winners are judged by

a representative panel chosen from the ranks of our faculty, and small cash awards are presented at the time of convocation the following fall.

*The Rationale Sheet Project.*—It is generally agreed that the student is trained more effectively, learns more easily, and develops greater incentive when he can identify himself as a member of the team responsible for the care of his patient. The relevance of this point of view was largely acknowledged by participants at the First Institute on Clinical Teaching held at

From a practical standpoint, the student is required to check into all diagnostic studies conducted upon his patient each day, and findings are recorded in his progress notes. Use of the "Rationale Sheet," however, requires further that he make some effort to evaluate the efficacy of those procedures completed or in progress (Chart 3). In other words, on the basis of his reading and conferences, he attempts to judge not only the value or lack of value of each procedure, but he also must make suggestions for new procedures. He then must-

#### SUGGESTED DIAGNOSTIC AND THERAPEUTIC PROCEDURES

### CHART 3

Swampscott, Massachusetts, under the sponsorship of the Association of American Medical Colleges last fall. The Rationale Sheet Project was brought into use at Meharry several years ago as a means of stimulating students to think critically and continually upon the day-by-day management of the cases assigned them. The term management here applies to all diagnostic and therapeutic procedures being conducted in the patient's behalf, other than those considered as routine. This critical appraisal obviously demands that students engage in considerable collateral reading with respect to their cases.

by the same token, be prepared to defend and justify his proposals, since, if his suggestions prove useful or indicated in the management of his patient, they may indeed be employed by the staff.

This aspect of the student's training program requires close supervision during the first few days of orientation. Later, when he loses some of his awkwardness, the incentive to do a superior job offers a high level of challenge, and he excels in an area of learning where lagging is commonplace.

All junior clerks are given a final oral examination before leaving the pediatric service, and the "Rationale Sheet" is used,

along with other basic and supplementary materials, in conducting this test.

*The Rule-in Rule-out Sheet Project.*—It has been our experience that, when a student writes a conventional history, including physical examination and preliminary laboratory findings, his differential diagnosis is rather shallow and limited. He seems more concerned with jotting down a specific diagnosis, with a somewhat superficial consideration of other possibilities, rather than with a critical and extended analysis of his

findings. This tendency may, in no small measure, represent undesirable motivation gained from reading the records of the house staff, or even the attending staff.

There can be no doubt that the mental gymnastics involved in making a satisfactory differential appraisal of findings are highly important in the development of a sound clinical approach for the medical clerk. How to implement this was our problem. The Rule-in Rule-out Sheet Project was established some years ago in an at-

DEPARTMENT OF PEDIATRICS—MEHARRY MEDICAL COLLEGE	
Rule-in Rule-out Sheet	
Name of Clerk _____	Date of Admission _____
Name of Patient _____	Age _____
Admission Diagnosis (es) _____	
Positive Findings:	
Historical:	
Physical:	
Laboratory:	
Special:	
Working Diagnosis (es):	
1. _____	6. _____
2. _____	7. _____
3. _____	8. _____
4. _____	9. _____
5. _____	10. _____
Differential Diagnosis List:	
1. _____	6. _____
2. _____	7. _____
3. _____	8. _____
4. _____	9. _____
5. _____	10. _____

CHART 4

tempt to improve this phase of the junior medical clerk's case study, by inducing him to apply himself with greater assiduity to the problems of differential diagnosis (Charts 4 and 5). The student is requested to list all positive historical, physical, laboratory, and special findings on the front of the Rule-in Rule-out sheet. He is then expected to discuss the prospects for diagnosis with members of the staff and to consult the pediatric literature.

After a period of 24-48 hours of research-reading and conferences, the student then,

necessary to further rule in or out the remaining disease entities. This step brings into use the Rationale sheet, which has already been discussed (Chart 3).

Experience with the Rule-in Rule-out Sheet Study Project indicates that this technique, in satisfactory use, does indeed induce significantly greater diligence on the part of students in matters of differential diagnosis. From a practical standpoint, each case becomes a clinical research project. The student is impressed with the overriding importance of pursuing the diagnostic

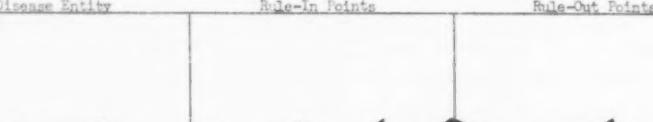
RULE-OUT RULE-IN POINTS ACCORDING TO DISEASE ENTITY		
Disease Entity	Rule-In Points	Rule-Out Points
		
Diagnoses Listed in Order of Preference		
1.		
2.		
3.		
Signed		Date

CHART 5

on the back of the Rule-in and Rule-out sheet, lists in the first column the various diseases to be considered in the differential diagnosis.

In the next column, he lists the positive findings of the case which led him to select these diseases as diagnostic possibilities. In the third column, the student lists the differential diagnostic points which tend to eliminate the least likely possibilities one by one. He proceeds in this manner until he is left with but one, two, or three strong probabilities. He then lists them in the order of his preference.

His next step is to list procedures and rationale considerations which he feels are

problem with an extended analysis and a critical appraisal until he arrives at a diagnosis that is both reasonable and satisfactory to his instructor and himself.

*The Consultation Sheet Project.*—Medical educators, concerned with the problems of finance, continue to tell us about the tremendous costs involved in providing highly specialized training in medicine. Bearing certain facts in mind, it is implicit, therefore, that maximum utilization of time and clinical materials be sought. It did not require an elaborate survey to convince us that greater utilization of the clinical materials available on our wards and in our nurseries was possible and desirable. Certain

facts were immediately apparent. For example, it was discovered that, unless a case presented unusual and striking features, only a handful of junior clerks might have the opportunity to see it. Again, if the interesting findings in a given case were fleeting or evanescent in character, even fewer students might be aware of its presence. Moreover, it became apparent that too often a given student observed a clinical phenomenon without really understanding its nature or recognizing its significance and, worse still, without taking the time to ascertain its *true* nature through adequate reading and conference.

The Consultation Sheet Project was developed in part to assure that each student would spend ample time at the bedside mak-

ing objective appraisals of his patient on a day-by-day basis (Chart 6).

It had been our feeling that, despite the fact that our students made regular progress notes, these notes did not necessarily represent a careful day-to-day physical evaluation of the patient by the student himself. The Consultation Sheet Project is designed to engage the student's sense of responsibility to his patient beyond ordinary requirements. It advocates that he should seek to be the first to discover objective changes in his patient's condition, and that he should endeavor to have early consultation so that his findings may be confirmed or correctly interpreted. This study-project places premium value on every positive physical finding, whether it occurs singly, or as part

#### DEPARTMENT OF PEDIATRICS—MEHARRY MEDICAL COLLEGE

##### Junior Clerk's Consultation Record

Patient's Name \_\_\_\_\_ Clerk's Name \_\_\_\_\_ Age \_\_\_\_\_

Diagnosis \_\_\_\_\_

Abnormal physical findings demonstrated:

1. Senior staff consultant's signature: \_\_\_\_\_  
Date consulted \_\_\_\_\_
2. Senior staff consultant's signature: \_\_\_\_\_  
Date consulted \_\_\_\_\_
3. Pediatric resident consultant's signature: \_\_\_\_\_  
Date consulted \_\_\_\_\_

Junior clerk consultant's signatures: \_\_\_\_\_ Date \_\_\_\_\_  
 1. \_\_\_\_\_ 6. \_\_\_\_\_  
 2. \_\_\_\_\_ 7. \_\_\_\_\_  
 3. \_\_\_\_\_ 8. \_\_\_\_\_  
 4. \_\_\_\_\_ 9. \_\_\_\_\_  
 5. \_\_\_\_\_ 10. \_\_\_\_\_

of a syndrome. If the student is wrong, for example, in mistaking rhonchi for rales, the correction is made, but his assignment is not finished until he has demonstrated the findings to five or more of his classmates and acquired their signatures along with that of the attending pediatrician on the Consultation Sheet (Chart 6).

The point is emphasized that the junior clerk should know about his patient's problem in greater detail than anyone else in the hospital, and it is our feeling and conviction that if he regularly follows through in the work of these various collateral study projects, greater ease and effectiveness in learning pediatrics will be a natural and an inescapable by-product of his efforts.

#### CONCLUSIONS

In conclusion, some advantages and disadvantages in the use of these auxiliary aids to clinical teaching may be listed as follows.

##### *Some advantages in use.—*

1. Integrates the student onto the medical team responsible for his patient's care.
2. Provides basis for a sense of "belonging," inasmuch as his suggestions and criticisms receive consideration.
3. Stimulates critical and constructive thinking along lines that are easily neglected or ignored by busy medical students.
4. Provides automatic guidance and spontaneity for work and study activities.

5. Affords basis for appreciation of the value of thoughtfulness and thoroughness in patient management.
6. Makes regular conferences with pediatric and consulting staff somewhat of a ritual.
7. Opportunity for case-review type clinical research.
8. Eliminates tendency to superficial evaluation of findings.
9. Stimulates development of desirable habits such as regularity in objective appraisal of patient.
10. Affords excellent basis for final oral examination.
11. Provides a platform of motivation upon which initiative may thrive.

##### *Some disadvantages.—*

1. Students require considerable supervision initially.
2. Evaluation of work is time-consuming.
3. Works hardship upon inadequate or limited teaching staff.

It must be acknowledged with candor that, while these supplements to the usual teaching regimen have aided us considerably in our efforts to provide a superior quality of instruction, they are not taken to represent a flawless panacea. Moreover, whereas we have not always achieved the optimum result in their use, it is our conviction that the deficiency resides largely within our ranks, and cannot be charged against the supplementary projects per se.

## Family and Community Practice in the Medical Curriculum

### A Clinical Teaching Program in Social Medicine

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This is a report of a project in medical education initiated in the Faculty of Medicine of the University of Natal. Now commencing its fifth year, this teaching program was introduced when the most advanced class of students at this university medical school began its first clinical year of study, in 1955. The first graduates from this school completed their final examinations in November, 1957. While the general structure of the curriculum is similar to that which obtains at other South African medical schools, there are distinctive features which are significant to our present review.

The curriculum extends over a period of 7 years, followed by an internship of 1 year required by the South African Medical and Dental Council. The extension of the course allowed for broadening the required foundation education of the student. While other universities provide for 1 year of study before admission to the medical school, introductory courses extend over 2 years in this university. In this way, Sociology, History, and English have been included as required subjects, in addition to the sciences required by the Council, namely, Botany, Chemistry, Physics, and Zoology.

On this foundation the course proceeds

for a further 2 years before clinical studies are fully developed. In addition to courses in Anatomy, Physiology, and Pathology, the curriculum includes a more extensive course in Psychology than is usual in this country (1). It is taught as a basic science, of relevance to the practice of medicine as a whole, and is of considerable importance to the project being considered here.

An important difference between this school and others during the clinical years of study has been the development of family and community care as an important area of the students' clinical experience. This has been done in the form of "Family Practice" clerking, which extends through the 3 years of clinical studies and constitutes the central core of the students' experience in Social and Preventive Medicine. It is with this particular aspect of the curriculum that this report is concerned. The course is conducted by the Department of Social, Preventive, and Family Medicine which was constituted in such a way as to allow for the kind of clinical teaching envisaged.

*The University Department and its community laboratory (2, 3).*—The establishment of the department was made possible by the sponsorship of the Rockefeller Foundation. The department has clinical and other service responsibilities in communities served by the Institute of Family and Community Health. This Institute with its community services provides the practicing and clinical base for the department in much the

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same way as do various units in teaching hospitals for departments of medical schools.

The Natal Provincial Administration, the hospital authority in the Province of Natal, is responsible for the Institute of Family and Community Health, as well as for the King Edward VIII Hospital, which is the teaching hospital of the medical school. A special agreement between the Provincial Administration and the University insured the coordinated functioning of the department and Institute by the creation of a number of associated posts. Thus, the post of professor and head of the department is associated with that of head of the Institute. Similarly, various academic grades, including lecturers and clinical tutors, were associated with posts at the Institute designated "family physician." In this way the department has several full-time, and a number of part-time, family physicians concerned with the students' experience in family practice. When the families of a practice constitute a neighborhood community, as they do in the Institute's practice, opportunities are offered for students to extend their experience of family practice to the appraisal of community health (4). The more immediate clinical teaching of family physicians is thus readily associated with community health studies in which the family physicians themselves are the main teachers. Other associated posts of the University and Institute assist in meeting these demands. In addition to a senior lecturer concerned predominantly with epidemiology and measurement of community health, there are associated posts for lecturers in health education and health educators of the Institute of Family and Community Health. Thus, the organizer of the Institute's Health Education Division is also senior lecturer in health education in the department, and his deputy at the Institute is lecturer in the department.

While the Institute provides a medium for student experience in family and community medical care, its functions do not extend to the wider aspects of public health of a city or country. The University has, therefore, invited the Medical Officer of

Health of the City of Durban to become honorary senior lecturer in public health administration in the department. At the same time, the City Council agreed to let the department have access to those aspects of city health services which might be needed from time to time.

*Organization of student experience.*—The students' experience is graduated to make use of the developing skills they acquire in their other clinical studies as well as in accord with their development in this subject itself. The "family practice" clerkship, which includes clinical studies and other practical exercises, is supported by lectures and seminar-discussions, for which 2 hours per week are provided over the 3-year period of the course.

To provide the students with a meaningful clerkship in family and community practice we aimed to provide for the following experience:

- a) A continuing relationship with individual patients and with the groups of which these patients are members, more especially their families.
- b) Studying varied case problems with particular emphasis on common problems of day-to-day practice in a community.
- c) Diagnosis of the state of health of a group, with particular stress on family diagnosis and on appraisal of a community's health.
- d) Study of the curative, preventive and promotive health functions of a community doctor in family practice, requiring participation in care of individuals, well and sick, and in family and other group programs.
- e) Consideration of the resources available for promotion of health and medical care within family and community as well as through various agencies.

To achieve these objectives, the clerkship requires students to attend the Institute of Family and Community Health as follows:

1. One session of 4 hours per week during each of the last 3 years of their course. This is in addition to the provision for lectures and seminars already mentioned.

2. A period of 4 weeks in residence during the final year of study has been provided for by the Faculty. It remains to be fully implemented, and the University is now negotiating for the provision of suitable accommodation for students at the Institute. Until these facilities are available, a temporary arrangement has been made for students to attend at the Institute daily for 2 weeks.

The clerkship involves family practice and community health studies in which individual, family, and community aspects of care are related. The clinical practice includes at least one "long term" family study, as well as a number of "short term" case allotments which provide varied experience in neighborhood family practice. The community implications of these individual and family studies constitute a bridge toward more defined community health studies.

*Clinical studies in family practice.*—The allotment of a student as student-doctor to a family for a period extending over the greater part of his final 3 years of clinical studies provides for experience of a continuing relationship with patients and the groups of which they are members. The significance of patient-doctor relationships emerges in this continuing contact with the individuals of the family, as does the role of the doctor in his relationships with the family as a group. Careful attention to the selection of suitable families and to the induction of the students in the early phase of their practice provide the foundation relationships needed for the "long term" family study to be a satisfactory learning experience.

Care of an individual patient is the usual starting point of a family practice, and it constitutes the student's first introduction to his family. An appointment is made for some member of the family to attend the Institute and meet the family's student-doctor. This introductory meeting is followed by others in which the student interviews and examines several members of the family; either by special appointment, or, if a family member is sick at home, the clinical tutor and student will visit the

patient together. During this foundation period of clinical study of the family, discussions are focused on the objectives and methods of interview. It is a period that corresponds with the students' first experience in their medical clerkship in the wards. Their developing skills in physical examination and diagnosis of various disease syndromes as a result of this clerkship are interesting to observe as they reflect themselves in family practice. On this foundation we are later able to extend his physical examination to include an appraisal of growth and physique as well as of the nutritional state. Interview and physical examination are associated with observation studies of the home and neighborhood, which we prefer the students to do after they have had a number of contacts with their families. Not only are their visits more acceptable to the families concerned, but the fact that the study has personal significance for their patients makes it more meaningful for interested students.

Supplementing their long-term family studies, the students are involved in a number of short-term studies, in which they have one or more contacts with members of a family. This offers the opportunity to study a wide variety of family health problems which are common in the community practice of the Institute. The epidemiological significance of the family is considered in relation to the particular condition of the patient, whether it be a long-term illness such as tuberculosis, a behavior disturbance in a child, a crippling disorder, or a more acute illness like acute nutritional failure, hysterical breakdown, or one of the many common infectious diseases of childhood. In addition to observation of home conditions, students are guided in their appraisal of the family's knowledge of these conditions and in relating this to the family's habits of living, to any measures it is taking to prevent spread, and to its care of the sick and the services being used for this purpose. Such investigations are used to illustrate the need for careful family studies as a foundation for the satisfactory care of patients.

In both the long- and short-term family studies individual case investigations are seen to have a double objective. There is, firstly, the immediate interest of the patient himself and, secondly, those of the family and other groups with whom the patient relates. Reaching a diagnosis and learning about a patient's life situation is directed toward both these objectives. While study of a patient's life situation is necessary in all clinical studies, the family practice clerkship requires students to know more of the patient's family life situation and to develop their appreciation of the social component of a patient's state of health alongside his physical and mental condition. Carrying these considerations further to the meaning of the diagnosis and findings for the patient's family is regarded as a foundation for a medical practice distinctively concerned with the health of the family.

The epidemiological significance of the findings in a particular patient is studied in the family as well as among other groups in the community with whom the patient or his family relate. There are the ways in which the patient's state of health may affect others or itself be a reflection of his life situation which he shares with his family. The processes by which the case findings may have family or even wider community implications are systematically considered along the following lines:

1. Transmission of the state of health to others: e.g., direct biological transmission, including consideration of genetic and intrauterine transmission; transmission of infection, considering modes of transmission as well as susceptibility and immunity of different members of family according to age and sex.

2. Social interaction of which the patient's condition has significance for the health of others: e.g., health and adjustment of a woman patient, appraised in relation to her maternal role and implications for the health of her children; psychoneurotic or other long-term illness in a patient considered in perspective of relationships with others in family and implications for stability and harmony of family living.

3. Shared experience, in which the patient's state of health is seen as an expression of a life experience which others have shared to a greater or lesser extent: e.g., customary practices and other culturally determined experiences such as feelings and framework of knowledge; food habits, sanitary practices, values, use of resources, especially health service; exposure to a common habitat (physical, biological and social); housing and environs, including the neighborhood and wider environment of relevance; common family history; family composition—size, situation (complete, broken), kind of family living unit; family status—stability, mobility.

Postulating the implications for a family of a patient's state of health requires consideration of individual attributes of the patient and other members of the family. Age, sex, position, and roles in the family are always of relevance as is the constellation of intra-familial relationships and the particular relationships which various members have with the patient. Sickness in the mother or father will influence the family's health according to the phase of development of the family and will vary with such factors as its completeness, complexity, and solidarity. So, too, will the health of other members be an important determinant of the way in which they may be affected by the patient's condition. The student's consideration of the implications of his findings for the health of others in the patient's family proceeds on the lines indicated. He is then encouraged to follow his tentative hypotheses through by extending his case-study from the individual patient to the family. In thus checking the impressions he has formed, he proceeds toward establishing a family diagnosis in which the pattern of health of the family is described in relation to the determinant processes.

*Community health studies in family practice.*—Within the context of the growing relationship with the families being studied, the student has the opportunity to consider the implications of family practise in care of

the individual, the family, and the community. The more immediate, or intra-familial, correlates of a family's health gain more meaning as its place in the community becomes known and the need for study of the interdependence of family and community health becomes apparent.

The social participation of family members in neighborhood and other community group activities provides critical information of their social health. "Face-to-face" groups of an informal, relatively continuing and intimate nature are among the most significant. Relative isolation of an individual or family from such primary groups is studied as a state of social health with its meaning for emotional and physical health. The overprotected child, kept away from his peer groups in the neighborhood, the man returned to his home after being away as a migrant laborer or as a patient in a hospital, the family who have just come to town, the family in disgrace or shame, the unaccepted couple of an intermarriage, each provides the student with opportunity for moving toward understanding of the interacting unity of social, emotional, and physical components of health and disease.

Similarly, the epidemiological and educational implications of participation in such primary groups are studied. Observation of the transmission of infection within these groups, and then to others, may be associated with appreciation of the role of these same groups in the transmission of local knowledge of the causes, preventive measures, and treatment of the infection. Analysis of the structure of informal groups like the many women's friendship groups in a neighborhood, discussion of the processes of communication, and the way in which change in behavior might be affected through such groups, are aimed to provide the students with an experience of the cultural determinants of health and hence of the channels through which desirable change might be affected.

In addition to the family and primary group-oriented community health studies indicated above, the students have practical

experience in other epidemiological exercises and in the use and interpretation of various community health indices. The clinical epidemiological studies previously considered are extended to a series of practical exercises in determining the incidence and prevalence of various disorders and mortality rates of the communities in which their family practise is based. The figures examined include those from records maintained by the Institute for these communities. Student comment on the facts presented requires their analysis of the material and comparison with the experience of other communities in South Africa and other countries.

Appraisal of community health is related to the action that should flow from such appraisal, and exercises in community health education follow. Again, no one procedure has been used. The aim has in each case been to have the students develop a program in order to meet a well defined community problem. Thus, one such problem was gastro-enteritis in infancy. The students then postulated the environmental and behavior determinants of this condition. The objectives of health education and the methods of evaluating its results were then defined, and their proposals were then compared with an actual program designed by the Institute's Health Education Section. Finally, the students outlined the way in which the program should be carried out, the groups to be involved and methods to be used, and again compared this with what was done under similar circumstances. Where possible they participated in, or at least witnessed, some aspects of the project. Study of the program and evaluation, by analysis of figures indicating changed behavior, completed the particular exercise. This type of experience, in designing and analyzing community health education projects, is closely linked with the epidemiological studies outlined above, in which measurable change in state of health of communities is related to social and cultural change.

In these various ways the students be-

come aware of the importance of associating *what* people do with the *why* of their so doing. Their foundation studies of the role of the family and informal primary group in determining health are thereby expanded to the broader consideration of the significance of culture in community health, and of the ways in which modification of behavior can be initiated within the community. Advice to patients, guidance of families, and education of the community through various groups and organizations are seen as complementary aspects of health education in which the community doctor can make a most important contribution. The insight this provides to understanding the behavior of people and, hence, to some appreciation of the cultural determinants of health and disease has been most satisfying.

#### ACKNOWLEDGMENTS

This approach in the teaching of undergraduate medical students by the University of Natal has been made possible by the sponsorship of the Rockefeller Foundation. The association of the Institute of Family and Community Health with the project is a result of the cooperation, first of the Ministry of Health and then of the Natal Provincial Administration.

The interest of Professor G. W. Gale, now of Makerere College, Kampala, Uganda, is deeply appreciated. First, as Chief Health Officer of the Ministry of Health he played a large part in facilitat-

ing the development of the Institute of Family and Community Health, and then as Dean of the Faculty of Medicine until 1955 he was largely responsible for the negotiations which led to the association of the Institute with the Department. His successor as Dean, Professor I. Gordon, has likewise taken a keen interest in the development of this project. Back of this academic development has been the real interest of the Principal of the University, Dr. E. G. Malherbe. To them and to my colleagues of the Board of the Faculty of Medicine, I am most grateful for their encouragement and their criticism.

Lastly, it is a privilege to pay tribute to my associates of the Department and Institute for their intensive work and their enthusiasm in developing the teaching program. Their relationship with the communities we serve is largely responsible for the cooperation we have had from individual patients and families. Their knowledge of health in the communities concerned has made their practices most fruitful components of the community laboratory which the Institute provides for our department.

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## Women in Medicine in West Virginia University

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Because the question of the place of women in the medical profession is still somewhat controversial, and because we have been connected with the West Virginia University School of Medicine and know personally almost every woman included in these data, we made this study of our medical school's women alumni. It is of historical interest that the admission of women to all branches of West Virginia University was in the earlier years a matter of serious concern, involving both the Board of Regents and the State Legislature. West Virginia University was founded in 1867, and, although a few women had been enrolled in some courses for several years, it was not until 1889 that coeducation was generally established in the University. Since the formation of our 2-year medical curriculum in 1902 until the present time, our admissions committees have accepted qualified women, with the result that the majority of our classes have included women.

*Sources of information.*—Information regarding the women who began their medical training at West Virginia University was available from the records of the University registrar, from the files of the alumni secretary, and in communications from the medical schools to which the women transferred for the completion of their training. Furthermore, the *American Medical Directory* provided data on their professional careers.

To secure direct, personal information from the graduates themselves, the office of the School of Medicine sent out questionnaires in 1951 and again in 1957 to the 59 living women who had graduated from

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our school, who later received the M.D. degree from another institution, and for whom we had available addresses. Forty-one women replied to one or both letters, usually recounting their personal stories and impressions of their role in medicine. Only a few questionnaires were returned for lack of proper addresses. However, we did obtain some information on even those women via newspaper clippings and other relatively indirect sources. Seven of the 59 are now deceased, and at least six of those died between 1951 and 1957.

We had to rely on the *American Medical Directory* for apparent recent material on only eight of the 59 women; but even that source offered some difficulty, because the professional names were not always those in our student files, the changes being due primarily of course to marriage and remarriage.

By no means the least of the sources of information for this study was our personal knowledge of these former students. By virtue of our small classes, we have been able to maintain contact with many of our students throughout the years; we had, therefore, considerable first-hand knowledge concerning the professional careers of many of these women.

*Number of female medical students in West Virginia University.*—Up to and including the class entering in September, 1958, 89 young women (Table 1) have commenced the study of medicine in West Virginia University. This number is 4.51 per cent of the total enrollment (1,970) since the founding of the School of Medicine in 1902. In this connection it is of interest that during the 1957-1958 school year 1,644 women

were enrolled in medical schools in the United States. Their number was 5.57 per cent of the total enrollment.

*Success in the study of medicine.*—Of the 80 women who entered up to the year 1954, the last class having time to complete its work, 64 have earned the M.D. degree. This number is 80 per cent of those who entered, and it is almost the same percentage of success as for the men during the same years.

versity School of Medicine to other schools have been successful in completing the work and qualifying for the M.D. degree.

Of the 20 per cent who did not complete the work of the first 2 years, the reasons for lack of success are not greatly different from those of the men who failed. Heading the list was poor scholarship, due perhaps in some instances to poor preparation in college, unwillingness to apply themselves, or lack of interest in medicine. A few had

TABLE 1  
SUMMARY BY DECADES

Decades	En- tered	M.D. De- grees	Mar- ried	Chi- ldren	De- ceased	Listed in AMA directory 1958	"Not in prac- tice" 1958	Amount of practice
Before 1900	1	1	0	0	1	0		1, 50 years. Full time.
1900-1909	1	0						
1910-1919	9	7	4	3	3	4	0	7, 28-40 years. Full time.
1920-1929	11	9	6	11	2	7	1	6, 23-32 years. Full time. 3, much less than full time.
1930-1939	21	17	14	18	1	16	3	13, 15-23 years. Full time. 4, Interruptions.
1940-1949	30	23	19	11	0	23	5	18, 4-14 years. Full time. 5, Interrupted or unknown.
1950-1954	7	7	2	4	0	4	1	7, Internship and residency training.
1955-1958	9	0						
Totals	89	64	45	47	7	54	10	52, Full time. 12, Interrupted. 64, Total number

One of the measures of the attainments of these women lies in the fact that all of them had to transfer to some other medical school at the end of their sophomore year in order to complete the last 2 years of the curriculum. The 64 who completed the 4 years received the M.D. degree from eighteen different medical schools. This is worthy of note, since the transfer from one medical school to another may create a genuine hardship for some students. It is a pleasure to record that, without exception, the 64 women who have been admitted with advanced standing from West Virginia Uni-

to withdraw on account of physical illness or emotional instability. In several instances they were married shortly after withdrawing from school. It is quite possible that they withdrew in anticipation of this event. It should be emphasized, however, that most of those who did marry while in medical school married medical students, received their degrees, and entered the practice of medicine.

*Localities of practice.*—Of the 64 women with the M.D. degree, 58 were from families residing in West Virginia at the time of their entrance to medical school. With re-

spect to their locations in the practice of medicine, the great majority have lived in other states since their graduation. An important factor in determining the locality of their practice is the circumstance that all our students have had to attend schools in other states for the completion of their work. The locality and acquaintances during the years of clinical training often play an important part in the selection of a place to practice. The geographic location of the internship or residency training may also be an important influence in this connection. Another factor is that the married woman physician usually locates in an area which is advantageous for her husband. Regardless of the reasons, the state has lost the professional services of many of these capable and earnest women. This is especially unfortunate since, in the scale of physicians per 100,000 population, West Virginia ranks forty-third, or sixth from the bottom.

*Marriage and children.*—By the time the M.D. is received, or even earlier, both men and women have reached the age when the urge for marriage and the establishment of a home begins to manifest itself. Here the sex differential becomes a cogent factor in determining the amount and nature of the professional activities of the physicians of the two sexes. It is well recognized that most women who enter the medical profession are by no means devoid of the desire for husband, children, and home. The married female physician may, of course, be forced for a time to stand aside from the responsibilities of medical practice because of pregnancy and the care of young children. These factors obviously place her at some disadvantage.

Of the 64 women with the M.D. degree, as far as we can learn, 45 have married. A few of these were married before entering medical school, some while in school, and the remainder after receiving the M.D. degree. Twenty-three of the 45 women married men with an M.D. degree. However, some of the remaining 22 seem to have married men in closely allied professions.

It is known that 22 of these women are the mothers of 47 children. Doubtless this figure is not complete. Furthermore, the 45 marriages and the 47 children mentioned above do not represent a total and final score for the 64 women, because the recent graduates still are young women.

In the replies to our questionnaires some of the mothers commented interestingly upon their ambitions for family life, and the relation of the bearing and care of children to their professional careers. Some continued their practice with little interruption during pregnancies and subsequent deliveries, while others suspended practice entirely for a few years while the children were small. One of these women is the enthusiastic mother of five children. She reported continuous practice since graduation, except for a "month's vacation" following the birth of each child.

*Fields of practice of medicine.*—In listing the different fields of practice by the women we are limited by lack of definite information about some of them. It is noteworthy that more seemed to be engaged in general practice than in any single specialty. Eighteen stated that they are so engaged, and ten others gave no specialty, so 28 are probably in general practice. Of course, some of those who did indicate a specialty may well also be doing some general practice.

Among the preferred or exclusive fields, obstetrics and gynecology leads with seven. This is followed by anesthesiology with five; pediatrics, five; and one or two in each of neuro-psychiatry, industrial medicine, diseases of the chest, ophthalmology, radiology, internal medicine, and teaching and research. One stated she was a chemist, but gave no further details. Of those in the specialties, five were listed in the *American Medical Directory* as having been certified by specialty boards. A few of the women were engaged in institutional work. It did not appear that many of the women who married physicians are in practice with their husbands, although some of them stated that at times they have assisted their husbands in practice.

*Amount of medical practice.*—It has not been possible to determine exactly the amount of practice of the women, either as to the number of years or its intensiveness. In most cases, however, a reasonably good approximation may be made. On twenty we have no information except from the *American Medical Directory*, and three have graduated so recently that they are not listed in the latest issue (1958).

Table 1 gives a summary, by decades, of the number who entered, their activities, and other pertinent data. The table shows that 52 of the 64 graduates have been in rather active practice since graduation. For those entering between 1900 and 1920, the years of activity range from 28 to 40 years. In more recent decades, of course, the years of activity become less, until for those entering from 1940 to 1949, the potential years since graduation range from only 4 to 14. Yet, for these women, sufficient time has elapsed to enable most of them to become rather well established and to do much useful work. Of those in the most recent group (those entering in 1950 and later) some have obviously not had time to become well established in any sort of practice.

Of the twelve whose practice has been far from continuous, ten are listed in the current *American Medical Directory* as "not in practice." Some of them are probably in this category only temporarily, although a few were so listed in earlier issues. With respect to those who have not been continuously active, it can hardly be said that their training is of no value, because the medical knowledge and point of view of these women is of use in the home and in the various community activities in which they participate.

Perhaps it should be mentioned here that prior to 1902, before West Virginia University had an organized medical curriculum, it did offer certain preclinical subjects, such as anatomy, physiology, and hygiene. These sciences were accepted by some medical schools for advanced standing. It is noteworthy that in 1899 one young woman

took some of these courses, transferred to the Illinois College of Medicine (a school no longer in existence), and was graduated with the M.D. degree in 1903. She then practiced in a small town in West Virginia for 50 years.

In summary, it may be said that Table 1 shows that the amount of professional activity of the group has been considerable, certainly enough to justify amply the admission of these women to the study of medicine. It should be noted, too, that the professional work of these women has not prevented a large percentage of them from enjoying the benefits of marriage and children.

*Women's feeling about their place in practice.*—The questionnaires sent to our women alumni included a question about their estimates of the place of women in the practice of medicine, as judged by their observations and experiences. Practically without exception they replied that, in their experience, the practice of medicine was a comfortable and rewarding field for women. They felt that the male physicians manifested no prejudice toward them, and that they were treated with personal and professional respect.

Another question asked whether they would recommend the study of medicine to a daughter or close female friend. The general opinion was that, provided such a young woman had a sincere personal desire to study medicine and also seemed to have the necessary personal qualifications, opportunity should be provided for her to enter that field. They strongly emphasized, however, that the choice should be made by the individual herself, and not on the recommendation or urging of any person or persons.

#### CONCLUSIONS

From a study of the data, and from our personal knowledge concerning many of the women graduates, it seems evident that they have made a definite and useful contribution

to the practice of medicine. The total of their professional activities is considerable, and, as far as can be learned, the quality of their work is of a high order.

In considering the worth of women in the field of medicine, it ought not to be said that they are useful in spite of the fact that they are women, but rather that they have

a special area of usefulness because they are women. There are situations, both professional and non-professional, in which a woman is perhaps better suited to give understanding service than is a man. It takes many different kinds of doctors in many kinds of professional situations to meet the needs of the many kinds of people.

## Medical Manpower in Michigan: Applicants to Medical School

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Concern about the adequacy of the supply of medical manpower in the United States has led to studies of the need for additional medical schools. One of the important elements in planning for this expansion is the supply of applicants.

There is considerable information about applicants to medical schools in the annual reports of the Association of American Medical Colleges and the Council on Medical Education and Hospitals of the American Medical Association. In the present report of a study undertaken for the Committee on Needs of Medical Education in Michigan,<sup>1</sup> information pertaining to Michigan residents applying to medical schools throughout the United States has been brought together and supplemented by data from other sources. The supply of medical school applicants is discussed from the standpoint of planning for a third medical school in Michigan. In addition, data concerning both the rejected and the successful applicants are presented.

### SUPPLY OF APPLICANTS

*Comparative rank.*—As shown in Table 1, Michigan on the average has ranked near the lowest third of the states in the period 1948-1956. The reasons for the relatively poor supply of applicants from Michigan are not entirely clear. Several alternative explanations for the supply of applicants from a given state can be considered.

When states are ranked according to the number of applicants to medical school per 100,000 population, it is found that states with the poorest supply of applicants are generally rural, and states with the best supply are generally urban.<sup>2</sup> This is to be expected, because of the greater availability of pre-professional educational opportunities in urban areas and the higher purchasing power of city families. However, urbanization alone does not explain the relatively large supply of medical school applicants in some states. As shown in Table 1, four of the highest ranking states, Utah, Nebraska, Colorado, and Vermont, are predominantly rural. These four states all have medical schools in which a high proportion of their applicants are accepted. Stalnaker has called attention to the relationship between the availability of medical school training places within a state and the supply of applicants from that state, using data for the years 1951-1953 (10). It appears that the high rank of these four predominantly rural states can be explained by the relatively high proportion of their applicants accepted in their own medical schools.

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<sup>1</sup> The Committee on Needs of Medical Education in Michigan was established in February, 1956, by the Board of Regents, University of Michigan. Dr. A. C. Furstenberg, Dean of the Medical School, is Chairman.

<sup>2</sup> Theoretically, the number of applicants should be compared with the number of people in the age group likely to enter medical school, i.e., those 20-24. Data are available for this age group only for the year 1950. For Michigan, which has a younger population than most states, the use of this more refined base would probably further reduce Michigan's rank.

However, the factors which seem to account for a given state's supply of applicants to medical school, its rural-urban composition, and the proportion of its applicants accepted in its medical school, do not explain Michigan's relatively poor supply.

Michigan cannot be considered a rural state. In 1950 there were 31 states whose population was more rural, and almost half

TABLE 1  
AVERAGE RANK\* OF STATES, 1948-1956, BY  
NUMBER OF APPLICANTS TO MEDICAL  
SCHOOL PER 100,000 POPULATION

Average rank	State	Average rank	State
1	New York	28	Montana
2	Utah	28	Maryland
4	New Jersey	28	Idaho
4	Nebraska	29	Georgia
5	Pennsylvania	30	Virginia
8	Connecticut	30	Minnesota
9	Colorado		
12	Vermont	31	MICHIGAN
13	Rhode Island		
13	Massachusetts	32	Alabama
14	Mississippi	32	Oregon
15	South Dakota	33	Delaware
15	North Dakota	34	Kentucky
17	Louisiana	34	Texas
18	Kansas	35	Tennessee
18	Florida	36	Wisconsin
19	Ohio	36	North Carolina
19	Washington	38	Iowa
21	Oklahoma	40	New Hampshire
22	Arkansas		
23	Illinois	43	Arizona
24	Wyoming	44	Missouri
24	West Virginia	44	Nevada
24	Indiana	46	Maine
25	California	47	New Mexico
28	South Carolina		

\* Represents average of state's rank for each of 9 years, 1948-1956 inclusive.

Source: Association of American Medical Colleges, Population for years 1948-1955 from *Personal Income by States*, U. S. Department of Commerce; for 1956, *The Statistical Abstract of the United States, 1958*.

the state's population lives in the Detroit metropolitan area. As an urban state, Michigan might be expected to have a much better supply of applicants to medical school than it has. Michigan also has a relatively high proportion of its applicants accepted. In recent years Michigan has ranked around twentieth in the proportion of her applicants accepted (6). As shown in Chart 1, Michigan

has had a consistently higher proportion of applicants accepted than has the nation as a whole. It would appear, therefore, that Michigan's poor supply of applicants cannot be attributed either to rurality or to a low proportion of acceptances in medical school.

A partial explanation for Michigan's low rank in the supply of applicants to medical school may be found in the occupational composition of the state's labor force. It has been shown that certain major occupational groups, i.e., "professional and semiprofessional workers" and "managers, officials and proprietors," are more likely than others to have children in medical school

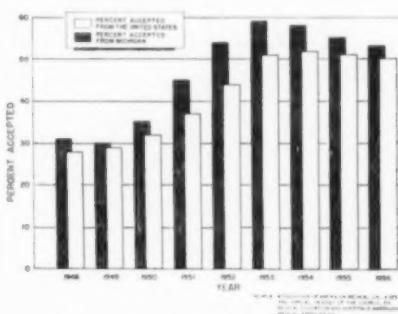


CHART 1.—Per cent of medical school applicants accepted in Michigan and in the United States, 1948-56.

(1, 9). Thus, a state whose labor force is composed of relatively small groups classified as "professional and semiprofessional workers" and "managers, officials, and proprietors" might be expected to have a relatively poor supply of applicants to medical school. In 1950, "professional and semiprofessional workers" and "managers, officials, and proprietors" constituted 16.4 per cent of the employed labor force in Michigan, the state ranking 30th from the top in this regard (11). Thus, the poor supply of applicants from Michigan may be explained in part by the occupational composition of its labor force.

Still another explanation for the poor

supply of applicants from Michigan may lie in the competitive attractiveness of alternative careers in the state's expanding industrial economy.

Despite Michigan's comparatively poor rank in the supply of applicants to medical schools, many more Michigan residents apply than can be accepted. The proportion of Michigan's applicants rejected was about 70 per cent in the 1948-1950 period and about 45 per cent in the 1952-1956 period.

**Trend.**—As shown in Chart 2, the number of medical school applicants from both Michigan and the United States as a whole has exhibited a similar trend from 1948

not sufficient to account for the much greater rate of decline in medical school applicants about 20 years later.

A more satisfactory explanation for the trend in the number of applicants may be found in the stability of the rejection rate of applicants to medical schools. As shown in Table 2, each year from 1926 to 1957, except for the period 1947-1951, the number of medical school applicants from the United States has been approximately twice the number of freshman training places available in the medical schools of the United States; i.e., the rejection rate has been about 50 per cent.

It is likely that, when the proportion of rejections reaches a level of about 50 per cent, many premedical students and their advisors perceive acceptance by medical school and a career in medicine as unrealistic goals, and the number of applicants is thereby limited. The large number of applicants in the 1947-1952 period was a reflection of the unusual conditions arising out of World War II. The downward curve in the number of applicants from both Michigan and the United States, shown in Chart 2, probably represents a return to a pre-war or "normal" relationship between the number of applicants and the number of freshman training places in medical schools.

**Projections.**—If the future supply of applicants to medical schools is assumed to be limited by the number of freshman training places available, a projected estimate of the number of applicants can be made simply by multiplying by 2 the projected number of freshman medical school training places. If a 50 per cent rejection rate is maintained and the number of freshman medical school training places is increased little, if at all, the future supply of applicants may well be much smaller than current projections indicate (2). In 1957 there were 8,030 places for freshmen medical students in the United States. If this number is not increased by 1965 and there continues to be a ratio of two applicants for each freshman training place, there will be about 16,000 applicants in that year. This is about

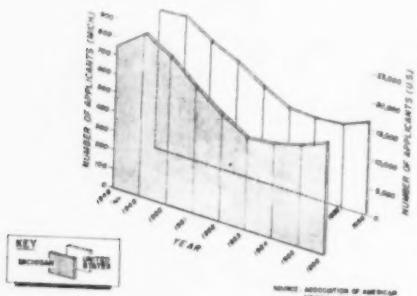


CHART 2.—Medical school applicants from Michigan and from the United States, 1948-56.

to 1956. In both cases there was a peak in 1948-1949, and a low point was reached in 1953-1954. It appears likely that the same factors which influence the supply of applicants in the nation are at work in the state.

The large number of applicants in the 1948-1949 period was probably due to the education and training benefits available under the G.I. Bill of World War II, which, by removing economic barriers to medical education, encouraged many veterans to apply to medical school. The small number in the 1953-1954 period has been incorrectly attributed to the low birth rate of the early 1930's. However, an examination of birth data shows that the rate of decline in the annual number of births in the 1930's was

6,000 fewer than the 21,800 applicants projected as a minimum figure by the American Association of Medical Colleges for that year (2).

For the purpose of planning additional medical schools, projections of the number of applicants based on presently available training places are of limited value. What is needed is an estimate of the number of applicants that would be expected if there were a sizable increase in the number of freshman training places. Projections which provide such an estimate are presented in Table 3.

These projections of the number of Michigan residents applying to medical school, 1957-1975, are derived from the following data: (a) the population age 18-24; (b) the ratio of college students to population age 18-24; and (c) the ratio of medical school applicants to college enrollment.

After 1960 a large increase in the 18-24 age group is expected in Michigan as a result of the high birth rates of the 1940's and the continuing net in-migration. As shown in Table 3, in 1950 there were 686,000 Michigan residents age 18-24. By 1960 the number is expected to reach 765,000, and in

TABLE 2  
APPLICANTS AND ACCEPTANCES, UNITED STATES AND  
MICHIGAN, SELECTED YEARS, 1926-1957

YEAR	UNITED STATES			MICHIGAN		
	No. applicants	No. freshmen accepted	Applicants per acceptance	No. applicants	No. applicants accepted	Applicants per acceptance
1926	10,006	6,009	1.7	*	*	*
27	11,287	6,199	1.8	*	*	*
28	12,420	6,277	2.0	*	*	*
29	13,655	6,457	2.1	*	*	*
30	*	*	*	*	*	*
31	*	*	*	*	*	*
32	12,280	6,426	1.9	*	*	*
33	12,128	6,457	1.9	*	*	*
34	12,779	5,356	2.4	*	*	*
35	12,740	6,015	1.9	*	*	*
36	12,192	5,910	2.1	*	*	*
37	12,207	5,791	2.1	*	*	*
38	12,131	5,764	2.1	*	*	*
39	11,800	5,794	2.0	*	*	*
40	11,854	5,837	2.0	*	*	*
41	11,940	6,218	1.9	*	*	*
42	14,043	6,425	2.2	*	*	*
43	*	*	*	*	*	*
44	*	*	*	*	*	*
45	*	*	*	*	*	*
46	*	*	*	*	*	*
47	18,829	6,487	2.9	*	*	*
48	24,242	6,688	3.6	750	230	3.2
49	24,434	7,042	3.5	861	256	3.4
50	22,279	7,177	3.1	797	280	2.8
51	19,920	7,436	2.7	665	299	2.2
52	16,763	7,425	2.3	561	303	1.9
53	14,678	7,449	2.0	486	286	1.7
54	14,538	7,576	1.9	490	282	1.7
55	14,937	7,686	1.9	536	296	1.8
56	15,917	8,014	1.9	592	312	1.9
57	15,791	8,030	2.0	*	*	*

\* Information not available.

Source: Annual Report of the Council on Medical Education and Hospitals. J.A.M.A., 168:1505, 1958; also previous reports in J.A.M.A., 93:531, 1929; J.A.M.A., 103:574, 1934; Staff Report to the Committee on Interstate and Foreign Commerce, House of Representatives. Medical School Inquiry; U.S. Government Printing Office, p. 212, 1957.

1970 there will probably be about 1,230,000 Michigan residents age 18-24.<sup>2</sup> Thus, on the basis of population alone, a large increase in the number of applicants might be expected.

The proportion of the Michigan population age 18-24 attending college has shown a consistent increase in the past decade. In 1950 there were 13.8 college students in Michigan for every 100 Michigan residents age 18-24, as shown in Table 3. By 1955 the ratio had risen to 17.3, an increase

students in Michigan in the fall of 1960.<sup>4</sup>

In 1955 there were 5.4 Michigan residents applying to medical school for every thousand college students in Michigan. These projections assume that this ratio will remain at the 1955 level until 1973. This ratio is kept at the 1955 level on the grounds that the present proportion of college students will continue to apply to medical schools each year until 1973 if training places are increased in proportion to the expected increase in the number of college students.

TABLE 3

## PROJECTIONS OF THE NUMBER OF MICHIGAN RESIDENTS APPLYING TO MEDICAL SCHOOL, 1957-1975

YEAR	NO. RESIDENTS	NO. COLLEGE STUDENTS PER 100 POPULATION	COLLEGE ENROLLMENT	RATIO OF APPLICANTS TO COLLEGE ENROLLMENT		APPLICANTS TO MEDICAL SCHOOL	Year <sup>a</sup>	No.
				18-24	18-24			
1950	686,000	13.8	94,723	.0059	.0059	1952	561	
1955	692,000	17.3	119,833	.0054	.0054	1957	647	
1960	765,000	20.8	159,000	.0054	.0054	1962	860	
1965	970,000	24.3	236,000	.0054	.0054	1967	1,270	
1970	1,230,000	27.8	342,000	.0054	.0054	1972	1,830	
1973	1,411,000	29.8	420,000	.0054	.0054	1975	2,270	

<sup>a</sup> In the period 1948-1955, the relationship between college enrollment and medical school applicants was closest when a 2-year lag in the number of applicants relative to college enrollment was used. Accordingly a 2-year lag is used in these projections; i.e., the 1950 college enrollment of 94,723 produced 561 medical school applicants in 1952; the 1955 college enrollment of 119,833 is expected to produce 647 applicants to medical school in 1957.

Source: Population estimates from Current Population Reports, Series P-25, No. 132, Table 1, adjusted for a continuation of the 1950-1955 rate of in-migration. College enrollment in 1955 from *The Statistical Abstract of the United States, 1956*. Applicants to medical schools, 1952, from the Association of American Medical Colleges.

of 3.5 in this 5-year period. The projections made in Table 3 assume a similar increase in succeeding 5-year periods. With increasing demand for college-trained persons and with rising levels of family real income, the proportion of persons attending college is expected to continue to increase rapidly for the next 20 years. If there are 765,000 Michigan residents age 18-24 and 20.8 college students for every 100 residents age 18-24 in 1960, an increase consistent with present trends, there will be 159,000 college

<sup>2</sup> Michigan's net in-migration is expected to continue at the 1950-1955 rate until 1970. U.S. Census Bureau estimates for population growth in Michigan through 1957 indicate the in-migration to Michigan since 1955 is continuing at the 1950-1955 rate.

This assumes that medicine will continue to be a highly attractive career choice and that there will be adequate financial resources to support individuals in medical school. The "theoretical demand" for medical education, i.e., the number of college students who would apply to medical school if the number of training places were not limited, is indicated by assuming that a constant proportion of college students will apply to medical school.

While these projections provide estimates of future "theoretical demand" for medical

<sup>4</sup> In the fall of 1955 college enrollment in Michigan was approximately 120,000, and in 1957 it had risen to 137,500 (12).

education, they do not indicate the future number of applicants in realistic terms unless the number of training places is sharply increased. To illustrate this point, there are at present about 300 places available for freshmen medical students from Michigan. If, by 1967, the number of such places were doubled, that is, increased to 600, this would permit accepting about half the 1,270 applicants projected for that year. Under these conditions the present rejection rate of 50 per cent would be maintained and the 1,270 applicants projected for 1967 would be a realistic estimate of the number of applicants as well as a satisfactory measure of the demand. On the other hand, if the number of training places in Michigan is not substantially increased, it is quite possible that there will be little if any increase in the number of medical school applicants from Michigan by 1967.

#### REJECTED APPLICANTS

The number of applicants rejected by medical schools each year includes some individuals who, having been rejected in previous years, reapply. It also includes individuals who will reapply in subsequent years. Some unsuccessful applicants are known to have applied 3 or 4 times.

The proportion of applicants in any one year ultimately accepted by medical schools can be determined by ascertaining how many rejected applicants, in any one year, reapply and are accepted in succeeding years. This was done for the 561 applicants from Michigan in 1952. As shown in Table 4, 303 or 54 per cent of them were enrolled in medical school in 1952. In the next 3-year period, 1953-1955, an additional 72 applicants, or 13 per cent of the original group of 561 applying in 1952, were accepted by United States medical schools (3).

From information supplied by the American Osteopathic Association, it was found that nineteen more applicants, or 3 per cent of the 1952 group of 561, were enrolled in schools of osteopathy in the 1952-1955 period. Thus, by 1955, 394, or 70 per cent of the 561 Michigan applicants in 1952, were

enrolled in United States medical schools or schools of osteopathy.<sup>5</sup>

If the group of 1952 Michigan applicants to medical school represents a typical experience, it is likely that about 30-40 per cent of any year's applicants will never be accepted. This rejection rate is somewhat lower than the 50 per cent rejection rate usually published, which is based only on each year's applicants.

Many of the rejected applicants are strongly motivated to study medicine, and their failure to be admitted produces intense disappointment (7). This was especially true

TABLE 4

MICHIGAN APPLICANTS TO MEDICAL SCHOOL, 1952, BY OUTCOME, 1952-1955

Status	Number	Per cent
Accepted	394	70
In U.S. Medical Schools		
1952	303	54
1953-1955	72	13
In Schools of Osteopathy	19	3
Rejected	167	30
Total	561	100

Source: Association of American Medical Colleges and American Osteopathic Association.

during the years immediately after World War II, when the rejection rates were quite high. The high proportion of rejected applicants caused public dissatisfaction with the medical schools. The medical schools in Michigan responded by increasing their enrollment and by reducing the number of places for out-of-state applicants. During the period 1947-1951 the University of Michigan Medical School increased the size of its freshman class from 130 to 200; Wayne State University Medical School, from 68 in 1950 to 75 in 1951.

The large number of applicants who are not accepted by medical schools has been

<sup>5</sup> It is possible that some of the original 1952 applicants were accepted in 1956 or in subsequent years. The number is likely to be very small in view of the fact that only seven of the original 1952 applicants were accepted in 1955. The number of rejected applicants who were accepted by Canadian and other foreign medical schools is not known.

viewed by some as evidence that more medical training facilities are needed. Others believe that for the most part these rejected applicants are not qualified and do not represent a reservoir of additional potential medical manpower. In general, insufficient attention has been given to rejected applicants, and there are several important unanswered questions concerning them.

For instance, how many, if any, of the rejected applicants could have successfully completed a course of medical study and made "good physicians" if training places had been available? In our present state of knowledge, it cannot be assumed that all the rejected applicants are not qualified. The qualifications of applicants appear to be judged by admissions committees in terms of the relationship between the number of training places available and the number of applicants. When the supply of applicants decreases, applicants who would have been rejected in former years are admitted. For example, in 1950, 60 per cent of the entering freshman classes in medical schools had undergraduate grades of less than an A average, whereas in 1952, with a sharp decline in the number of applicants, 82 per cent of the entering students had grades of less than A (4). This indicates the flexible nature of the judgments about who is qualified to study medicine.

Recent studies of the selection process have clearly indicated its shortcomings (5). The characteristics of a "good physician" have not been defined in specific terms, nor can future patterns of behavior be predicted from present characteristics and abilities. Even with the best intentions, therefore, medical school admissions committees are not able to make their selections using scientifically established criteria. It is possible that some of the applicants who would make the best physicians are not now being admitted.

Another important unanswered question is how can the best use be made of the premedical training of rejected applicants. To answer this question we need to have information which is not now available on

the subsequent careers of rejected applicants. With an increasing need for technically trained personnel in our society, the scientific preparation of the rejected medical school applicants should be utilized to the fullest.

Despite the many unanswered questions concerning rejected applicants, some information is available. For the United States as a whole rejected applicants make poorer scores on the Medical College Admission Test than do successful applicants (6). Michigan residents who applied to medical schools in the United States, 1952-1955 inclusive, were studied from data made available by the Association of American Medical Colleges. It was found that rejected applicants tend to be slightly older than accepted applicants. The median age for the former is 23.5 years; for the latter, 22.3 years. These slight age differences may be due to the preferential treatment given younger applicants by admissions committees or to the generally poorer qualifications of older applicants. It has been shown that older students, after admission to medical school, make poorer grades (8).

It was also found that there are marked differences in the proportion of applicants from the several undergraduate colleges who are rejected, as shown in Table 5. The University of Michigan has the lowest proportion of its applicants rejected, 25 per cent; the "Big Three," 31 per cent; and the small Michigan colleges, the highest, 43 per cent. Out-of-state colleges have about the same proportion of their students from Michigan rejected by medical schools as do the small Michigan colleges. There are some notable exceptions to the tendency for the larger undergraduate institutions in Michigan to have more success with their medical school applicants. For example, Calvin College and Albion College, two small institutions, had only 18 per cent and 24 per cent, respectively, of their applicants to medical school rejected.

It is only natural that the great majority of Michigan residents applying to medical schools would take their premedical training

in Michigan colleges and would come predominantly from the state's three large universities. Table 5 shows that 1,094, or 84 per cent, of the 1,300 applicants in 1952-1954 came from Michigan colleges. Of the 1,094 applicants from Michigan colleges 747, or 68 per cent, were from the "Big Three," the University of Michigan, Michigan State University, and Wayne State University. The relatively small number of medical school applicants from Michigan State University, the state's land grant college, is probably a reflection of the more rural character of the student body at that institution.

#### ACCEPTED APPLICANTS

*Place of origin.*—Information on the home town of applicants is available only for those who were successful in gaining admission to medical school. In the period

1952-1955, 1,124 Michigan residents were enrolled as freshmen in United States medical schools. The home town of sixteen of these students could not be ascertained. Table 6 shows that over half the freshmen medical students, 585 or 53 per cent, came from the Detroit metropolitan area. Another third, 374 or 34 per cent, came from the heavily populated southern part of Michigan. Only 149, or 13 per cent, came from the rest of the state.

When students enrolled in Michigan medical schools are compared with those in out-of-state medical schools, it is found that similar proportions of both groups come from the several geographic areas of the state, except for the Northern Peninsula. About 8 per cent of Michigan students going to out-of-state medical schools come from the Northern Peninsula, compared with about 2 per cent from this area going

TABLE 5  
UNDERGRADUATE COLLEGE OF MICHIGAN APPLICANTS TO MEDICAL  
SCHOOL, 1952-1954, BY OUTCOME, 1952-1955

COLLEGE	Number	TOTAL		ACCEPTED		REJECTED	
		Per cent	Number	Per cent	Number	Per cent	Number
All Michigan colleges	1,094	100	713	65	381	35	
"Big Three"	747	100	516	69	231	31	
University of Michigan	381	100	287	75	94	25	
Michigan State University	91	100	61	67	30	33	
Wayne State University	275	100	168	61	107	39	
Other Michigan colleges	347	100	197	57	150	43	
Out-of-state colleges	206	100	121	59	85	41	
Total	1,300	100	834	64	466	36	

Source: Association of American Medical Colleges.

TABLE 6  
PLACE OF ORIGIN OF MICHIGAN RESIDENTS ENTERING U.S. MEDICAL SCHOOLS, 1952-1955

GEOGRAPHIC AREA OF HOME TOWN	ENROLLED IN MICHIGAN MEDICAL SCHOOLS		ENROLLED IN OUT-OF-STATE MEDICAL SCHOOLS		TOTAL	
	Number	Per cent	Number	Per cent	Number	Per cent
Detroit metropolitan area*	506	53.3	79	50.0	585	52.8
Southern, except Detroit	319	33.6	55	34.8	374	33.8
Central	80	8.4	9	5.7	89	8.0
Northern part of Lower Peninsula	22	2.3	3	1.9	25	2.2
Northern Peninsula	23	2.4	12	7.6	35	3.2
Total	950†	100	158	100	1,108†	100

\* Includes Wayne, Macomb, Oakland, St. Clair counties.

† Excludes 16 students whose home town was not known.

Source: Association of American Medical Colleges.

to Michigan medical schools. This is probably due to geographic and other ties between the Northern Peninsula of Michigan and the State of Wisconsin in whose two medical schools some of these students enroll.

It is to be expected that the more populous urbanized areas of a state would produce more medical students than its rural areas. This is the case for Michigan not only in an absolute sense, but also when the lesser population density of the rural areas of Michigan is taken into account. Table 7 shows the number of students from each of the geographic areas of Michigan entering

Michigan medical schools. The number of physicians' services, per population unit, is much greater in metropolitan areas, and more physicians are required in such areas to meet this demand. From this point of view, it could be argued that more students, in proportion to population, should be taken from metropolitan areas.

It should be pointed out that acceptance of applicants according to their academic qualifications would probably lead to a preponderance of urban students, since academically better qualified students tend to be concentrated in urban centers. One way for a medical school to try to improve the

TABLE 7  
MICHIGAN RESIDENTS ENTERING MICHIGAN MEDICAL SCHOOLS,  
1952-1955, PER 10,000 POPULATION, AGE  
20-24, BY PLACE OF ORIGIN

Geographic area of home town	Medical students	Population age 20-24	Students per 10,000 population
Detroit metropolitan area*	506	243,314	208
Southern, except Detroit	319	163,937	195
Central	80	52,026	154
Northern part of Lower Peninsula	22	13,222	166
Northern Peninsula	23	18,668	123
All Michigan	950†	491,167	193

\* Includes Wayne, Macomb, Oakland, St. Clair counties.

† Excludes sixteen students whose home town was not known.

Source: Association of American Medical Colleges; U.S. Census Bureau, Census of Population: 1950, Vol. II, Part 22, Table 41.

Michigan medical schools in relation to the population of these areas, age 20-24. It is seen that the Detroit metropolitan area has the most students relative to population, 208 per 10,000, and the Northern Peninsula, the fewest, 123.

The place of origin of medical students has an important bearing on the distribution of physicians within a state. It has been shown that medical students tend to go into practice in places similar to their home town (13). Since the need for physicians in rural areas is a pressing problem, it might be argued that medical schools should give preferential treatment to applicants from rural areas as a matter of social policy. On the other hand, the economic demand for physi-

distribution of physicians within the state is to encourage efforts which would increase the number of academically well qualified students from rural areas.

During the past decade it appears that the differences between the geographic areas of Michigan in supplying medical students has been decreasing. A study of the 1940-1944 graduates of the two Michigan medical schools shows that it would have taken a redistribution of about 7 per cent of the students, from urban to rural areas, to equalize students and population (3). For the 1952-1955 students, a redistribution of 4 per cent would have accomplished the same purpose. Presumably, the number of academically well qualified applicants from ru-

ral areas in Michigan is showing some relative increase. Whether this is due to the recruitment efforts of Michigan's medical schools or to the rapidly rising levels of living in rural areas is not known.

*Medical School.*—In the period 1952-1955, about 85 per cent of Michigan applicants who gained admission to medical school were enrolled in the two Michigan medical schools, the University of Michigan and Wayne State University. This proportion has remained relatively constant since 1951. It is evident that Michigan residents look principally to the two medical schools in the state for their medical education. In 1955 these two schools accepted 254 Michigan residents, 47 per cent of all Michigan applicants in that year.

The two medical schools in Michigan admit relatively few out-of-state residents. In the pre-World War II period and from 1946 to 1956, all the freshmen accepted at the Wayne State Medical School were Michigan residents. The proportion of out-of-state applicants accepted at the University of Michigan Medical School dropped from 25 per cent in the 1936-1940 period to about 15 per cent at present. This geographic restriction provides more training places for Michigan applicants, but it reduces the pool of qualified applicants from which the state's medical schools can choose its students and probably lowers the quality of the student body.

Even so, there is still concern in some quarters about the out-of-state residents who gain admission to the state's medical schools. In this connection it should be pointed out that in 1957, 25 out-of-state residents were accepted in Michigan medical schools, two in Wayne State University and 23 at the University of Michigan, and 48 Michigan residents were enrolled in medical schools outside the state, as shown in Table 8. This disparity has existed at least since 1946. Michigan is a debtor state to the other states which provide places in medical schools for Michigan residents. It would seem more equitable for a prosperous

state like Michigan to provide at least as many places for out-of-state residents in its medical schools as medical schools in other states provide for Michigan residents.

#### SUMMARY AND CONCLUSIONS

This study of Michigan residents applying to United States medical schools may be summarized as follows:

1. Compared with other states, Michigan has had a consistently poor supply of applicants to medical school. Of the several fac-

TABLE 8  
FRESHMEN MEDICAL STUDENTS BY STATE  
OF RESIDENCE AND STATE IN WHICH  
ENROLLED, 1946-1957

Year	Number of non-Michigan residents enrolled in Michigan medical schools	Number of Michigan residents enrolled in out-of-state medical schools
1946	25	40
1947	19	56
1948	36	49
1949	15	52
1950	8	55
1951	20	40
1952	27	57
1953	29	36
1954	37	39
1955	28	42
1956	20	53
1957	25	48
Twelve-year total	289	567

Source: Annual Reports, Council on Medical Education and Hospitals, American Medical Association.

tors which seem to influence the supply of applicants from a state, it is the occupational composition of the labor force in Michigan which seems most likely to account for its comparatively low rank.

2. In the 1948-1956 period, the number of Michigan residents applying to United States medical schools showed wide variability, ranging from 861 in 1949 to 486 in 1953. The difficulty of gaining admission to medical school in the 1948-1950 period

probably led to this sharp drop in the number of applicants.

3. Projections based on expected population increase and trends in college enrollment indicate that there may be a doubling of the number of Michigan residents applying to medical school by 1967 and almost a fourfold increase by 1975. The conditions under which these projections may be useful for planning purposes are presented.

4. Further study is needed to determine the number of rejected applicants who could have successfully completed a course of medical training if training places had been available for them.

5. Applicants who are rejected tend to be older. There are marked differences in the proportion of the applicants rejected from the several undergraduate colleges studied.

6. Those who have been accepted by the two Michigan medical schools are found to be over-represented, relative to population, in the Detroit metropolitan area and the populous southern part of the state.

7. While the great majority of successful applicants were enrolled in the state's two medical schools, these two schools can provide training places for fewer than half the Michigan residents who apply each year to medical school.

8. Planning to meet medical manpower needs must take into account the future supply of applicants to medical school. This study indicates that the future supply of medical school applicants in Michigan will be adequate for any contemplated expansion of medical training facilities in the state.

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## A Long-Term Experience with Joint Medical-Psychiatric Teaching\*

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This presentation describes a joint clinical teaching experience of two men—one a psychiatrist, the other an internist. This experience has continued over a 6-year period, with variations in the details of the happenings but with the core of the teaching methodology remaining basically the same. It is thought to be worth-while to present because of its continuity, because essentially the effort has been confined to these two men, and because the relationship of the two teachers has remained basically stable throughout the latter years of the effort.

Originally this exercise was designed for senior medical students during their medical clerkships. The aims of the exercise were formulated in terms of some variant of the problems of medical practice as they are seen by the general practitioner. At first the number of students attending the exercise varied. We had experience first with a group of eight to twelve; later, there was a period when as many as twice that number attended. In the past 3 years, we have with considerable gain to the exercise been able to keep the number of students at about eight or nine. For the past 2 years they have been equally divided between juniors and seniors. In attendance at these exercises are also the medical intern and resident, as well as, on occasion, visitors from the psychiatric

resident staff. The level of education and sophistication of the seniors in the beginning we grossly judged as about average for senior medical students throughout the country. This could be said of the information usually subsumed as both "medical" and "psychiatric."

The core of the exercise is the presentation of, interview of, and discussion of a patient from a medical ward. This ward is a small unit, basically the service unit for a large Ob-Gyn hospital. However, because it is also used for teaching and is approved for medical residency training its actual scope is broader than obstetrical. There are in it a number of male patients and a relatively high proportion of patients whose disorders have little direct relevance to either pregnancy or gynecologic disorders. In addition, a certain number of patients are admitted either as direct emergencies or are referred as semi-emergencies from the medical school Out-Patient Division. Socio-economically the patients generally meet the criteria of medical indigence. In most instances they have been for a long time without adequate funds to permit private hospital care. However, some are economically able to get a certain amount of private care prior to hospitalization and between hospitalizations. The age range of the patients covers a wide spectrum. Teenagers, the 20-30-year age range, and the very old are represented in adequate numbers for teaching purposes. A greater number, however, are in the range from 40 to 60.

The method of presentation is as follows: The conference takes place once a week for

\* Read at the meeting of the Association of American Medical Colleges, October 15, 1958.

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a period of 8-12 weeks, is scheduled to last 1½ hours, but can go for a half hour longer if the discussion is prolonged. Actually the 1½-hour period is generally sufficient, and the time limit does for the most part impose a constructive economy of teaching effort. The patient is picked for presentation primarily by the medical resident, less frequently by the intern. After some exposure to the conference the students are fairly vocal and important in the choice of patient. It is essential that neither of the teachers imposes any strict criteria in the choice. New residents are simply told that any patient will be suitable. The early choices of patients by a new resident and/or new group of students are almost always patients with obvious and major psychological defects or disorders. Later choices are more likely to be patients who would pass for "organic" under any circumstances. At the later time what is being looked for is an opinion on the total care of these patients. The progressive change in choice of patient for the conference is one of the best signs that learning is taking place.

As the conference is now conducted the patient's history both of present illness and the past personal history as well as the physical, laboratory, and x-ray findings are presented by a senior medical student. Most often the historical material he presents comes from one, possibly two lengthy interviews with the patient. A junior student in the group has also been assigned to the patient. Generally he has known the patient for a longer period of time, and he adds information to that presented to the group by the seniors.

Following the presentation of the student's available material, generally of about 20 minutes' duration, the patient is interviewed principally by the psychiatric member of the two teachers. Additional information is usually elicited by the internist. Particular stress should be placed on the methodology of the interview. Neither teacher feels constrained to "confine himself to his own field." The prior presentation, especially the statement of what the

student wants to learn further, as well as the early responses of the patient determines the nature of the interview, and with reasonable skill a great deal can be learned in 30-40 minutes. It should be stressed that the patients are told they will see two senior physicians, one of them a psychiatrist. For the latter no euphemistic terms are permitted. No deceit, cover-up of function, or any other method of hiding the profession of the psychiatrist is allowed. We look on this as a critical and essential part of the learning processes of the students.

Following the interview the total material is discussed with the students. The method of discussion is primarily one of questioning, probing the students for their knowledge, testing out what their questions are, and finally a summary statement by the two teachers of the problem as they see it. This is a joint effort, not one man presenting his views, then the other. In the multitude of cases presented over the past 6 years, it has not been necessary to compartmentalize the position of two disciplines.

The atmosphere of this conference is important from the following standpoints. (a) It is not a conference where two professors take an unknown and create a brand new concept for the supposed edification of the student. It is our opinion that we add to the breadth and depth of students' knowledge, but they already have some idea what aspects of the patients' difficulties need to be understood. We count it as the basic teaching method by which, as the weeks progress, the student's needs and knowledge become broader and deeper. In essence the student has the idea; the conference is only a means of focusing this idea.

b) One device which we believe gives consistent meaning to the conference is the over-all stress on the here and now. It has been our aim throughout this experience to teach what can be learned from patient's appearance, his present illness, his own statement of what he believes needs to be done to help him. To give a specific example of this, emphasis is not on diagnosis per se in the classical form. We do not lose

time in that totally unrewarding question "Is it organic or isn't it?" Rather, consistent emphasis is laid on treatment and disposition at all levels. What happens tomorrow, next week, next month, and next year with the patient, who does what for him, and what are the possibilities for the patient are the questions which permit the participants reasonable unity of discussion.

c) This is not an occasion for either the internist or the psychiatrist to show how bright he is. Neither one nor the other is allowed to become the focus of the conference. We do not assign in advance the amount of time to be utilized by each participant, nor deliberately force the discussion into any mold, but rather encourage a natural unfolding of the pertinent material. In this the two-person aspect acts as a balance to prevent one or the other teacher from imposing a distorted part picture.

d) We feel the conference is not properly called an integrating conference in the sense that it is not disintegrated in the beginning. The way in which the conference works keeps a single image of the patient before the student at all times. He is not given first a "psychiatric image," then a "medical image," and asked to either choose sides or shift from one to the other. Rather, he is asked to think through the questions—what is the patient's present problem, what does he bring to this which determines his reactions, how does and will he treat that patient himself, what can and will he do to alter the pathological forces at work. Bluntly, it is not the job of the psychiatrist to come in and tell what is wrong, nor is it the internist's job to make an organic diagnosis, suggest physical treatment, and then bow out. It is the job of both to explore the total illness of patient and in such a way that the experience of the students will be deepened.

e) As a corollary to the last, neither teacher considers the exercise a way of exposing the students' ignorance. Generally speaking, they are all too painfully aware of this in any situation where they are called on to perform. Adding to this can only be

uneconomical from the teaching standpoint. It wastes other students' time without teaching the individual. The mutual approach of the teachers of this conference is the expansion of what the students already know. We find under these circumstances that students are willing to and comfortable in saying what they don't know. They are able at times to question the instructors and even disagree with them.

f) In the hour and a half period we don't expect to "know" the patient in all respects. There are always many obscurities left. But for the student to learn that he doesn't have to "close the case" immediately is good. Generally we feel we have been able to teach something of how to deal with the patient.

g) We feel an important lesson is taught in response to the reiterated question of students, "Is what the patient says or what is in the chart 'accurate?'" As the time of a group with us extends we more and more stress that what the patient says today and how he behaves today are the data which must be dealt with. The reasons for behaving in this way, telling his history the way he does, reacting in the mood and with the group as he does are things which can be profitably searched out. That one interviewer is told one thing, another something perhaps diametrically opposite raises only the momentary question which is "the true story." The essential fact is that a different kind of information was given. If the conference is to teach at all it teaches how these apparent disparate bits can make a more unified story.

h) There are certain kinds of major "organic" defects which we find are rather consistently missed by residents, interns, and students. Though sometimes seen as simple organic problems the presenters are frequently vaguely puzzled by some aspect on which they cannot "put their finger." The first of these types is the patient who is constitutionally poorly endowed. This diagnosis is generally not close enough to awareness for the students to think of it. Altogether they tend to over-estimate the

intelligence of their patients in their own images. Less often patients with secondary defects due to diseases affecting the cerebral cortex are "missed." Here, the presenters usually at least vaguely consider this area of diagnosis, but often discard it for want of the more obvious classical signs. We have found that the variations in mental capacities which begin to occur with advancing age are an especially useful way in which to begin to demonstrate the so-called organic syndrome. Examples of this have been usefully supplied from the ward not only by older patients but by those with the accelerated aging in diseases such as diabetes and hypertension. These have proved useful for joint teaching in that discussion can be either gross or subtle depending on the level of awareness in the particular group of students.

i) Major magical systems playing into the patient's ideas of self-treatment are commonly demonstrable in patients presented. These are variants of systems commonly seen by internists and those in general practice. The value of the conference as we see it is in alerting students to these. It is in relation to these that we attempt to tie in the folklore of medicine that so many of these patients utilize. This area also permits discussion of the bridge between psychosis, psychotic-like symptoms, neurosis, and culturally imposed beliefs. After a

number of sessions we find students far more skilfully handling these ideas.

Various of the maintaining attitudes of the two teachers have been discussed under the separate headings above. Mutual tolerance, ability to differ on specifics without losing sight of the over-all goal, willingness to actively interrupt the other at any time, unwillingness to try to impose their own specialities all play an important part. These suggest strongly that this kind of exercise is not for a junior staff member. We would especially doubt its efficacy if both were members of the junior staffs of their respective fields.

Under the conditions which we have described we believe that a student learns much about the broader and more difficult problems of medical practice. He develops skills in picking salient features of the complex involvements in which patients find themselves. He learns a total approach to illness rather than a compartmentalized one. The process we have observed goes on in the interval between sessions. With each group we have been able to observe, week by week, sharper questions being asked by students, the bringing in of more substantial data, the broadening of areas with which they are willing to deal. And we believe one of the best tests of learning is that late in a series we rarely have by direct question or by implication the problem posed—"Is this psychic or organic?"

## MEDICAL EDUCATION FORUM

### Editorials

"HOUSES ARE BUILT TO LIVE IN, AND NOT TO LOOK ON"<sup>4</sup>

A dangerously false yardstick of achievement is being used in some circles these days for the evaluation of higher education. According to these standards, measurements of accomplishment are equated to substantial and beautiful buildings. While knowing better, some institutions are yielding to the temptations of "marked" money and building greatly. The stature of the resultant monument is but poor salve to an uneasy conscience struggling with the priority demands of an inadequate budget.

Such an attitude results in the creation of many fine structures without an acceptance of responsibility for their continued support. This continued support relates not merely to the physical plant itself but even more acutely to the activities of the faculty and students who are the heart and soul of the institution.

Teaching and research, the cornerstone of medical education, are two inseparable facets of a single process. The results of activity in research permeate the whole body of teaching, crystallizing and clarifying the content of instruction. By contrast, teaching in medicine when isolated from research becomes decadent and in time ineffective.

The general acceptance of the importance of research in a medical school environment is evidenced by the fact that our present serious financial needs do not lie in this particular area of medical education. Private foundations and the federal government in recent years have sponsored research in the medical sciences rather substantially. The major criticisms heard from medical schools concerning private and federal grants for research relate not so much to their amounts as to the growing burden of indirect costs which must be borne by the grantee institution.

The major economic issue facing medical education pertains neither to the acquisition of new buildings nor to the financing of research, important as these are. The issue which will influence—more than any other single factor—the continued growth of American medicine, focuses on the very mundane item of an adequate operational budget. This poor step-child of the academic budgetary household is lost amidst the glitter of buildings and the glamour of research.

Bronze plaques commemorating donors are easily fitted on the substance of buildings, and names lend themselves rather artistically to the granite cornerstones of research institutes. But rare is the donor with either the foresight or the humility to support the hearthstone of medical education with unrestricted operational funds.

This somewhat tenuous situation is further jeopardized by insidious encroachments from

<sup>4</sup> Francis Bacon, *Essays XLV*, 1625.

within. Inadequate grant allowances for the overhead of research projects continue to erode into the operational budget. Even beautiful and substantial buildings deteriorate with age, and only the very unusual donor has projected his gift to account for maintenance.

Medical educators are faced with the difficult task of convincing private philanthropy as well as the state and federal legislatures that "Houses are built to live in, and not to look on."

MELVIN A. CASBERG

#### WESTWARD, MEDICAL EDUCATION!

The rapidly increasing population in some of the western states poses serious problems for medical education. The expansion of opportunities for potential medical students has not kept pace with population trends. Fortunately, the western states are conscious of the problem, and recent developments have real significance.

The western empire, stretching from Colorado to California, embraces a number of states which are without medical schools. These include Idaho, Montana, Wyoming, New Mexico, Arizona, and Nevada. About 10 years ago the University of Colorado School of Medicine, under the leadership of Ward Darley, initiated agreements with Wyoming and New Mexico to accept a stated number of qualified medical students each year. In turn, these states agreed to pay a sum which, when added to the out-of-state tuition, would approximate the actual cost of the student's education. From these beginnings emerged the Western Interstate Commission for Higher Education (WICHE), which has been described in detail in a previous article in this journal. Today, students in medicine, dentistry, and veterinary science from western states without facilities in these fields have an opportunity to attend institutions in compacting states under partial subsidy. WICHE is also making important contributions in determining resources and needs in the health fields.

Yet, there is agreement that WICHE is not the complete answer to all aspects of professional education in the West. New schools in the health professions are needed.

More recently two of the western states, Arizona and New Mexico, have been studying the possibility of opening formal programs in medical education. Although New Mexico has decided to defer a program, Arizona, with a rapidly rising population, seems destined to initiate a formal program in undergraduate medical education in the immediate future. Recently, the Arizona Medical Association devoted one full day of its annual meeting to a consideration of medical education.

The University of Arizona is located at Tucson, while Arizona State University is located at Tempe near Phoenix. As in other states, the problem of geographical location is a thorny one.

A survey of resources, needs, and objectives has been agreed upon as the first step in Arizona. The question of the development of a medical school in contrast with a complete University Medical Center which would embrace all health professions needs to be determined. There is concern as to the problem of Arizona's ability to adequately finance a program in medical education. The soundness of initiating a 2-year program as a beginning has been discussed. The general sentiment at the recent meeting expressed a preference for a full 4-year program. The question of location will probably be settled eventually on the floor of the Arizona Legislature.

For those of us who participated in the Arizona sessions, it was heartening to see the

State Medical Association, under the leadership of President Dermont Melick, facing up to the problem through discussion and consultation.

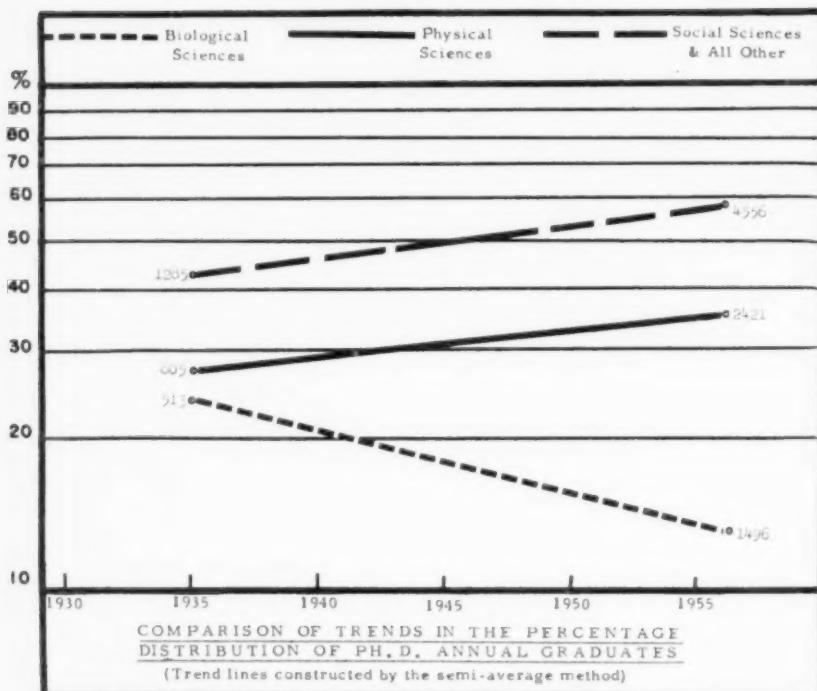
Perhaps the western states have not paid sufficient attention to the importance of intern and residency programs as sources of practitioners for their areas. The medical graduate today is a migratory mammal whose geographical orientation is primarily "Western." High quality intern and residency programs would attract good young men—many of whom would remain to practice in the area.

No one denies that there is a need for more medical schools and that the need is only for good ones. With expanding water resources and a climate which appeals to many Americans, Arizona has a "sunny" future. The Sunshine State is on the threshold of a significant development in medical education.

JOHN Z. BOWERS

## Datagrams\*

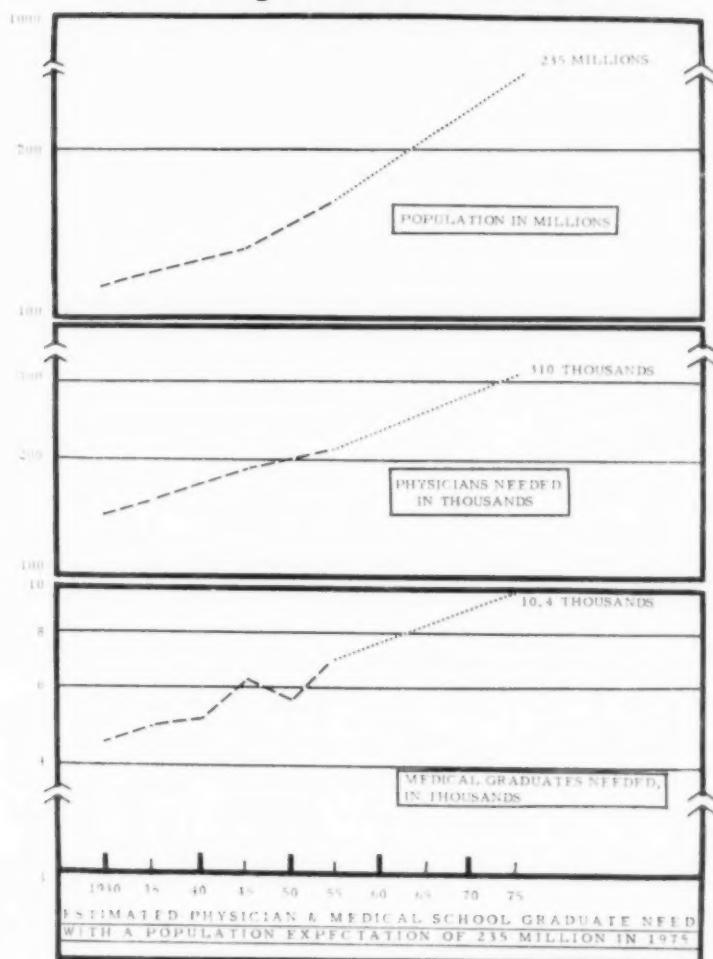
### PRODUCTION OF DOCTORATES



The trend is downward in the percentage distribution of doctoral graduates (Ph.D.'s or equal) in the biological sciences during the years 1935-1956. This is in contrast to an upward slope for the production of doctorates in both the physical sciences and the combined arts, social sciences, humanities, education and other. The actual numbers of doctoral graduates in all categories have increased considerably since 1935. The trend in the proportion of biological science graduates, however, has gone down. This decline in the proportion of Ph.D. graduates in the biological sciences has serious implications for the medical schools, many of which report increasing difficulty in filling budgeted academic positions. What should medical educators be doing to influence a reversal in this downward trend?

\* Submitted by the Division of Operational Studies of the AAMC. Source of information will be furnished on request.

## MEDICAL GRADUATE NEEDS IN 1975



The population of the United States is expected to rise by 60 million to a total 235 million by 1975. In that year a total of 310 thousand practicing physicians will be needed to maintain the present ratio of 132 physicians per 100,000 population. Unless the medical educational capacity of the country is immediately augmented, the number of medical graduates in 1975 will fall far short of the estimated requirement of 10,400 per year. Seventy-eight medical schools in the United States graduated only 6,861 students last year.

## Address

### WITH ALL THY GIVING, GIVE UNDERSTANDING\*

GEORGE W. CORNER

The Rockefeller Institute, New York

With all thy giving, give understanding—that is the text and the topic of my discourse today. If this were a school of divinity instead of medicine, I should certainly make my excuses for deliberately misquoting one of the great passages of the Bible to make a title for this address; and indeed there may be among this present audience persons learned in the Scriptures who have detected the change I made. The proverb actually reads, "With all thy getting, get understanding." That is what these students of medicine, who have just received the title of doctor, have been trying to do for the past 4 years. They must have been appalled, from time to time, by the amount of understanding their teachers expected them to get. Now here am I, calling upon them to give understanding as well as get it. That too is a colossal task, one that will keep them busy for a lifetime. I hope that I am not again appalling these young doctors; there is another saying in the Bible, which I do not twist, "It is more blessed to give than to receive."

The range of understanding required in the practice of medicine is very wide. It reaches from the body to the soul, from flesh and blood to the phantasms of the mind and the aspirations of the spirit. No wonder, then, that physicians in all ages of the past and in our own day, observing the ailing body and the tortured mind, have wondered whether they were looking into two realms of nature, the physical and the mental, or only one in which the functions of body and mind are inextricably mingled.

Two unforgettable cases stand out in memory from my own student days. One was grossly physical. The patient, a great hulking stevedore, was at home one evening in his kitchen, gorging himself on a steak dinner with alcoholic accompaniments—literally gorging himself, for he bit off more than he could chew. When a large chunk of meat stuck in his throat, he felt that he was being suffocated, and in a sort of animal frenzy took up a piece of heavy wire that was at hand and tried to push the meat down his gullet. In this desperate effort he succeeded, but incidentally perforated his esophagus with the wire, which passed into the mediastinum and set up a fulminating infection that brought him to the operating table. The other patient was a frail elderly woman who had to be led into the ophthalmology clinic because she had gone blind. Her eye-grounds were normal, and the reflexes to light were present and active. There was in fact nothing physically wrong with her; it was a clear case of mind-blindness, soon explained by the kindly questioning of our professor. She had a husband who had treated her cruelly for a long time, until she wished she need never see his face again. At that point, her weary subconscious mind obligingly opened a circuit somewhere in the optic tract, cut off her brain from her eyes and left her in a dark refuge where she might expect compassion instead of scorn.

\* Commencement Address, The Woman's Medical College of Pennsylvania, June 10, 1958.

Yet the first of these contrasting cases was not purely physical; for there, too, the damage was done by a terror-stricken mind turning upon the body. Nor was the second case, in its clinical aspects, purely mental, for our professor found it necessary to use his ophthalmoscope—most physical of all the physician's instruments—before he could complete the diagnosis; and moreover, I dare say, the biochemists will some day put these strange cases of hysterical amaurosis on a strictly physical basis by locating the synapses involved and identifying the enzyme systems that give way under mental stress.

Two realms, or one? The best practical answer to this question, from the physician's standpoint, was given here in Philadelphia on an occasion much like this one, in an address to the medical students of the University of Pennsylvania 153 years ago by Benjamin Rush:

Man is said to be compound of soul and body. However proper this language may be in religion, it is not so in medicine. He is, in the eye of a physician, a single individual being, for so intimately united are his soul and body, that one cannot be moved without the other.

The best physicians have always acted upon this principle, but as medical thought advances, the profession tends to emphasize one aspect of the problem, then the other. This is true of the very first extensive body of medical writings, the Hippocratic books. Composed at a time when traditional theories were being cleared away and practice based on observation of physical signs and symptoms, they have little or nothing to say about psychosomatic illness. Galen, on the other hand, was a professed psychotherapist; he boasted of his skill in diagnosing the illness of a young woman which, as he discovered, sprang solely from the emotional distress of unrequited love.

Turning to modern times—or relatively modern—when I was a student, American medicine was in much the same position as Greek medicine in the Hippocratic age. Great advances in pathology and bacteriology in the nineteenth century had cleared away much unfounded speculation and made our teachers skeptical of all causes of disease other than the purely physical. The emphasis was heavily on somatic disease. We were taught never, never to think of a symptom as hysterical or neurotic until every possible physical cause had been excluded. Mental suggestibility was mentioned chiefly to explain apparent therapeutic effects from inert drugs. Pierre Janet's then recent studies of hysteria and neurosis scarcely affected the medical curriculum, and Freud was still over the horizon as far as our preceptors were concerned.

The pendulum was ready to swing, however, and I have lived to see the rise of a whole school of physicians and psychologists who readily assume psychic causes of frankly physical lesions—many of them, indeed, willing to accept a psychic cause even before they exclude the physical. The best of these have taught us much, but sometimes they go too far. I once had a student in my anatomy class, who had been trained as a clinical psychologist, before coming to medical school. When he learned that the cadaver to which he was assigned came from a state hospital for epileptics, he gave me and his classmates an impromptu lecture, explaining that epilepsy, even in its most severe form of *grand mal*, is always a psychogenic disease. But the Lord delivered him into my hands. The day came, in the course of dissection, when we had to expose the brain, and there on the inside of the skull, exactly over the central sulcus, was an exostosis, a bony tumor the size of a hazel nut, pressing deeply into the motor cortex. Whereupon he heard a lecture, from me, on the possibility that neurological disease may have a physical cause.

Fortunately the upholders of these two ways of looking at human illness have never managed to cancel out each other's ideas, like the two eighteenth century philosophers of

whom Sidney Smith wrote that Bishop Berkeley destroyed the physical world in one volume octavo, leaving nothing but mind; and in 1737 David Hume destroyed that by another book.

At the present time, in fact, the medical profession has come to understand fairly well the mutual involvement of body and mind in every state of health and sickness. I doubt not that these young people now entering upon the practice of medicine have been prepared for their work by teachers who share and apply the principle so well stated by Benjamin Rush.

It seems to me, however, that current trends in medical science threaten again to swing the pendulum toward a purely mechanistic view of the sick human being. Modern biochemistry, biophysics, and pharmacology have gone a long way toward explaining the activities of the human mind in terms of enzyme reactions and electrical phenomena. They have given us such a revealing glimpse into the mysteries of sensation and thought that we tend to forget how far we still are from understanding the higher functions of the mind. Last February a *New York Times* writer, reporting a meeting of the Biophysical Society at the Massachusetts Institute of Technology, declared that "if you live to the twenty-first century, your family doctor may look like an electronic computer." He had heard one of the biophysicists say that all the facts about a patient's body and mind might be run through such a machine and in a few minutes the electric brain would come up with a diagnosis. This scientist pictured, the *Times* said, a future in which medical information on every person, from the cradle to the grave, will be recorded and stored in a central computing office. In each new check-up of a given patient, any deviation from previous health recordings would be promptly noted by the computer-diagnostician, which would have no "forgetting curve" like that of a human doctor. No forgetfulness, perhaps, but also no imagination, no sympathy, no compassionate understanding. What, for example, could an electronic computer have contributed toward diagnosing the illness of my stevedore with a mediastinal abscess, or finding the real cause of blindness in the woman with hysterical amaurosis?

But other new advances are pushing the pendulum the same way. The new mood-compelling drugs are of course pointing toward chemical stages in brain metabolism, presumably depending on specific enzyme reactions, which determine the course of mental activity and when sufficiently disturbed lead to depression, mania, or schizophrenia. Some enthusiasts in our profession, elated by this new hope of understanding and controlling illnesses of the mind, are now deprecating the study of higher psychic functions in disease. A prominent neurosurgeon, who is an ardent opponent of psychoanalysis, said to me recently, "The new drugs are going to put the analysts out of business!" "But surely," I said, "even if you can cure a psychosis with your drugs, is it not important to understand the irrational thought processes by which the patient's symptoms were determined?" "No, no," said he, "if we can cure him, who cares what was going on in his mind when he was ill?" Since that conversation I have heard, on the contrary, a psychoanalyst declare that the new drugs are a godsend simply because they enable the physician to make better contact with the disturbed patient and get at the nature of his irrational thinking so as to straighten it out; and for once I found myself agreeing with the analyst against his more conventional critic.

Although these examples refer to psychiatric illness, the same threat of an overly mechanistic outlook applies to general medicine, for every illness involves in some degree anxiety, self-distrust, or downright fear to which the doctor must minister as much as to physical discomfort or pain.

These graduates of today, I know, cherish no false visions of a mechanical age in medicine

when the physician's compassionate understanding of the sick person's mind and spirit as well as his body will no longer be wanted. They recognize that the human spirit has complexities far beyond the present reach of mechanistic science. They have cared for ailing people in the wards and outpatient departments and know that when (as an ancient sufferer cried out) "the whole head is sick and the whole heart is faint," what the patient needs from his doctor first of all is understanding. No matter how trivial, how physical the illness—a case of chicken pox or lumbago as well as a gastric ulcer or acromegaly—the patient years for comprehension. He wants his doctor to know who he is and why he is there, and how much he aches, and what his family are thinking about his illness, and what will happen if he doesn't get well, and everything else that a wise, sympathetic, and patient physician can discover behind and beyond the immediate symptoms, that can possibly bear upon his illness, and his state of mind. Give him a thorough physical examination, use all the sphygmomanometers and encephalographs you like, even an electronic computer, if you must; make a correct diagnosis, give him the newest drugs; but with all thy giving, give understanding.

The gift of understanding is bestowed in many ways. Sometimes by the spoken word, repeated, if needs be, over and over again until the message sinks in; at other times with a mere phrase or even in silence. The well known bacteriologist, Hans Zinsser, tells us in the poignant last chapter of his autobiography *As I Remember Him* that when his health began to fail he consulted a doctor in Boston who was an old friend, one of those precious individuals, he said, whom Nature has meant to be physicians. At the conclusion of the medical examination the diagnosis was all too clear; there was no need for either man to say a word. The doctor showed his affection and understanding by leading his patient to an office window overlooking the Charles River. It was a beautiful June day. Side by side, the two men looked out upon a bright and attractive world, and Zinsser knew that he would not long be able to enjoy it.

Sometimes a very different approach is indicated. A great-uncle of mine practiced medicine in Baltimore for 50 years, in many families treating three generations. His people loved him, and he got to understand them very well indeed, but he had his own methods of dealing with them. A friend of mine, a girl of 18, told me herself the story of one of his professional visits. The pampered daughter of a wealthy but excitable household, she had acquired a hysterical fear of lightning. Caught outdoors one summer day in a furious thunderstorm, she got drenched to the skin and terribly frightened, and reaching home in a state of nervous exhaustion, took to her bed, shivering and weeping. Her mother sent for Uncle John, who sat by her side while she sobbed out the story; then he rose, picked up his hat and bag, and firmly said, "Good day, Roberta, I don't treat fools." Fortunately, she soon came to herself and felt that she had been well understood and properly treated!

In other cases, the physician's understanding may be required at a higher level. Among the general run of mankind who present themselves in the consulting room, who knows when there may come to the doctor a scholar, philosopher, or poet whose personal problems will test the doctor's mind as well as his heart. Edward L. Trudeau, for example, took care of Robert Louis Stevenson, at Saranac, with such appreciation of Stevenson's sensitive temperament that he gave the lonely invalid new spirit in his fight against tuberculosis. What of the doctor who has to treat patients like Benjamin Franklin when he developed the torturing illness of his later years, Beethoven when he lost his hearing, or Winston Churchill, down with pneumonia but still smoking his big cigars? Some years ago, when a certain great lady, a distinguished concert singer, died in the hospital of the Rockefeller Institute,

her daughter wrote to the physician in charge:

I have a great emotion of gratitude to you and your helpers for what you did for my mother. You saw that she was a unique person, and she was grateful for the way you understood her. You made it better for me too, through your calmness and frankness and understanding.

Such superior people, when ill, need to be understood as much as the lowliest poor devil in the free dispensary; if anyone doubts the universality of this need, let him try getting ill himself, and see how he grumbles if he thinks his doctor is not trying to understand his personality and situation as well as the disease.

Among the graduates before me, some, no doubt, are thinking that I am speaking only to those who intend to practice medicine directly. Many of you, I know, will devote your lives to the laboratory, to teaching, or to administration; but you are accepting today, with your doctor's diploma, the same responsibilities as your classmates. Less frequently than they, but often enough, you too will be called upon to listen to the distresses and fears of individual human beings and must try to understand and help them. Even if you never see a patient in the ordinary way, your relatives, your students, your neighbors, knowing that you studied medicine, will ask your advice about other doctors; they will put it up to you whether to go on a reducing diet, whether to consult a chiropractor, or to risk a dangerous operation. If you become a professor, it may be your job some day, as happened to me, to get a suicidal student safely into the psychiatrist's office, or deal with cases of desperate homesickness, and claustrophobia, and alcoholism. If you become an administrator, your M.D. degree means that you can never see the problems of a delinquent or incompetent employee as only a matter of business. The special insight of the physician will temper your decisions and often, I fear, keep you awake at night reviewing your problems. You are, in fact, accepting the doctor's duty to give understanding to suffering and confused people without the possibility of working off your sympathy by direct professional service. Often, you will wish you could absolve your responsibility by using your stethoscope and writing a prescription rather than by listening to a long story of perplexity or grief and racking your brain for a cure you cannot yourself provide. But like your colleagues who minister directly to the sick, you too will have your grateful patients, and will rejoice to hear them say, "the doctor understood me."

Another reason why as a medical scientist I presume to discuss this subject is that the understanding of human nature is a part of the science as well as the art of medicine. To observe people, to take note of their individual characteristics, their needs, their reactions to every sort of circumstance, is in some degree a biological research, a study in natural history. I am prepared to argue that some of the most humane physicians, some of those who exhibited in a notable way an understanding of their patients, have been partly impelled by this sort of scientific curiosity. Benjamin Rush, for example, whom I have already quoted, collected human beings and their idiosyncrasies much as some naturalists collect butterflies or practice bird-watching. His diaries contain innumerable field notes on the behavior of *Homo philadelphensis*. He inquired into people's religious views and recorded what they said in illness and *in articulo mortis*. Hearing of a woman who had reached an advanced age he went to talk with her just to find out what it feels like to be extremely old. When he heard of any sort of unexpected behavior he tried to figure out the reason for it. Whenever an interesting acquaintance died he immediately wrote down a little sketch of his life and character. Thus he saw every case of illness against the background of the

patient's whole personality.

Other physicians equally interested in human nature have turned to books, finding in biography and fiction condensed reports of interesting and instructive lives. Sir William Osler, great Anglo-American figure of my student days, was one of these. Of course he also advised studying live people; to a student audience he once said "Begin with careful observation of your fellow students and of your teachers; then, every patient you see is a lesson in much more than the malady from which he suffers." Yet Osler shows in his own writing how much he learned about human nature by studying people who presented themselves to him between the covers of books as well as those whom he saw in his consulting room and in the wards of the hospital. Like many other teachers of medicine who have loved their books, Osler was fond of recommending his own favorite volumes to his students. The list might strike you as very serious and a bit old-fashioned; it contained no fiction except Shakespeare and *Don Quixote*. Any list I might offer, if I dared compete with Osler, would suggest novels of the better kind as valuable casebooks of human natural history, especially for the young. In the latter half of life, when for many years one has been observing his own antics and those of his kinfolk and acquaintances, and has followed the life story of many a real person to the last chapter, novels lose something of their relative power to excite and educate; but I still recommend them to you young people as studies of mankind by skilled observers. I am myself old-fashioned enough to prefer well seasoned fiction, Dickens and Thackeray, for example, before *Peyton Place* or *By Love Possessed*. Characters who have held their interest for many generations of readers are more likely to illustrate the general, recurrent, timeless traits of human behavior than is the untested fiction of the day. The Victorian writers, moreover, display something more than clinical curiosity; they look behind the surface of human frailty and weakness, just as a good physician does, trying to find the sound core of humanity that is worth our best efforts to solace and sustain.

There is still another source of information by which we can learn what people are like. Wordsworth wrote that

One impulse from the vernal wood  
May teach you more of man,  
Of moral evil and of good  
Than all the sages can.

This of course is nonsense if taken literally; who can learn about mankind from a vernal wood? What the poet really meant is that in the quiet solitude of the forest one can look into his own mind and calmly observe that particular sample of human behavior which originates there. "The heart knoweth his own bitterness," said another poet, "and a stranger doth not intermeddle with his joy." But joys and sorrows are the common lot. The physician aware of his own moods, aims, and aspirations sees them reflected in other people and learns to do for them what he would himself need in similar circumstances. Studying human nature from self-analysis, from the people about him, and from the protocols of history and literature, he prepares himself to minister to the whole personality of his patients, giving them the fullest benefits of medical art and science.

In the name of your chosen profession, I bid you welcome to its ranks, commanding to your care the bodies and minds of your patients and the troubled spirits of all who seek your aid. By your skill and understanding may they be healed.

## Letter to the Editor

We have been giving considerable thought to some of the problems discussed in the editorial "Drugs and Medical Schools," and I'd like to suggest that a study be undertaken to elucidate the business and financial relationships between medical schools and pharmaceutical companies.

As a result of interest in a recent paper on drug advertising (*New England J. Med.*, 259: 121, 1958), we have been discussing with representatives of the pharmaceutical industry several problems of mutual interest. Highly placed executives in the industry have stated that their industry deserves a great deal of credit for its support of medical education. We know of specific companies where this is beyond question. However, there is a distressing vagueness when the entire industry is considered, and I believe it would benefit all concerned if the actual facts could be found out. Some of the points which might be considered in such a study are as follows:

1. What is the total yearly amount granted to medical colleges, and on what basis is it distributed? The president of the Pharmaceutical Manufacturers Association has stated that last year about \$20,000,000 was contributed to schools and similar institutions to support education, basic and applied research. If this were evenly divided among the nation's schools, each would receive about \$250,000 per year from this source. On the basis of my contacts with other medical educators, I suspect that this figure is far too high. What is the correct figure, and how do the different companies compare in this respect? It appears to me that some companies are generous and others stingy. Should we not distinguish between them?

2. To what extent are medical colleges actually subsidizing the pharmaceutical industry through training of personnel? As you pointed out in your editorial, this is probably a sizable contribution. I estimate that, in our institution, despite a government training grant, we subsidize each Ph.D. to the extent of about \$3,000 per year, or \$12,000 per degree. What weight should be given to this situation in evaluating the over-all relationships between medical schools and the drug industry?

3. What proportion of the funds given by the industry to the schools were unrestricted, and what proportion were based on contracts for specified research?

4. On several occasions, representatives of pharmaceutical firms have asked for our assistance in various matters and suggested that, in return, they would send us, free of charge, substantial amounts of some of their newer products for incorporation in our own studies. It was pointed out to them that the actual market value of the drugs they proposed to give was well under \$200. At the same time, the cost to the medical college of testing these materials was well over \$2,000. Therefore, we felt that an arrangement such as they proposed would involve medical college subsidization of their firm. They readily acknowledged the logic of our position, but indicated that it was a new thought to them. It was implied that other institutions had been accepting such arrangements. How are such arrangements generally regarded? Should they be considered favors given by industry to the school, or vice versa? What are the economics involved?

5. I suspect that the most extensive financial subsidization of the pharmaceutical industry by medical schools is in the area of research grants, both basic and clinical.

Many companies contract with medical schools to have pharmacologic and toxicologic tests done on their new products. On several occasions, I've been asked to undertake such projects, and declined because of other commitments. When I suggested that the company do the tests in its own laboratories, I was told it was too expensive—that it would cost them several times the amount that medical schools would do it for. This was puzzling, because there was no reason to think that our efficiency was several times that of industry. In discussing this with people who had had business and accounting experience, it was pointed out to me that, in such cases, medical schools do not employ the usual methods of cost accounting. Accordingly, when a school accepts a \$5,000 grant to study the effects of drugs on animals, the work done may have a real value of \$15,000 to \$20,000 if standard cost accounting procedures were used. This would mean that in situations where everyone thinks the drug company is subsidizing the school, the reverse is actually true. I think that this aspect should be investigated by persons with sound business training.

6. In clinical research, medical school subsidization of the drug industry may come about in two ways:

a) The more tangible aspect involves the failure of the school to apply standard cost accounting procedures in evaluating the cost to them of the project. For example, drug company officials told me of one arrangement made for clinical study on one of their products. To handle the added volume of paper work in the school, another secretary was needed, so the drug company agreed to pay her salary, and also supplied free drugs. No other payments were made, or even asked for. The investigator believed the drug company was subsidizing him to the extent of \$4,000-\$5,000 a year. Actually, he had not considered the time taken by himself, other doctors, nurses, and other personnel in this study, let alone overhead. If standard cost accounting procedures had been used, they would have showed that the drug company received \$25,000-\$50,000 worth of work for only \$5,000.

b) The less tangible, but probably most important, subsidization involves the use of the medical school name and reputation. Companies are aware that a paper written by a doctor without a medical college affiliation carries much less weight than one emanating from a medical college. In their ads, they exploit to the fullest extent the medical college affiliation of authors reporting favorably on their products (example enclosed). To be sure, the language is dignified, but the basic intent is to convey to the reader the impression that a medical college professor endorses their product. Since the name of the individual professor is frequently not familiar to the reader, it is the name of the school that really gives the weight of authority to the claim. In a strictly business sense, this involves getting a testimonial for the price of a handful of pills, or a secretary's salary.

To be sure, one can argue that it is a duty of a medical school to investigate new drugs. What of it? It is the duty of a physician to help sick people, but no one says he isn't entitled to a fair fee for his services.

I am aware that this problem is far from simple, involving considerations of ethics, and for that reason, I think it deserves serious study.

My guess is that a careful study would show that if the drug companies had to purchase from other business firms the services they now obtain so cheaply from medical schools, they would pay between 100 and 200 million dollars a year. This, roughly, would be the

extent of our subsidization of their industry, and they only repay a minute fraction.

By contrast, they spend about \$300 million a year in advertising. Their lavishness, and indeed extravagance, in this area is demonstrated by the yearly expenditure on advertising to each doctor. In 1957, it was \$1,390 for each practicing physician, and in 1958, it was over \$1,400 per year per practicing doctor.

SOLOMON GARF

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## Communications

### FUNCTIONS OF A MODERN MEDICAL SCHOOL

AUGUSTUS J. CARROLL\*

A medical school must support a variety of teaching, research, and service programs—all directed toward more and better medical care for everyone. While few persons would question the *teaching function* of a medical school, the interrelation, interdependence, and inseparability of teaching, research, and medical service are often challenged.

The following discussion is a response to such a challenge.

From the beginning man has sought to relieve suffering and cure disease to produce a better and longer life. By his experiments and research he has gained the knowledge and skills represented by modern medicine. Research has made the difference between the uncivilized medicine man and today's physician. Medical research and medical progress go hand in hand.

For generations desperate, experimenting efforts to relieve suffering and to save lives were performed by the doctors on their patients. This was the medical research of yesterday. Today, in our teaching medical centers, doctors and scientists combine their knowledge and talents and do their research on paper, in the libraries, and in the laboratories. They use all available scientific knowledge, plant life, and animal life to minimize and safeguard experimenting on human beings.

By public insistence, medical research and medical progress are expanding rapidly, not in a straight line, but in all directions like the spokes of a wheel. As they extend outward medical knowledge is accumulating rapidly, but the frontiers of knowledge are also expanding, and entirely new areas of research are being opened.

Medical schools must provide for the future. To produce today's and tomorrow's doctors, researchers, and teachers they must always be in the forefront of medical progress. Without the stimulus of research this would be impossible.

It is the opportunity to do research as much as anything else that attracts doctors to teaching careers. A medical school that does not offer such opportunities will not be able to recruit a competent faculty. The cost of medical research is an investment in the future health and security of the nation, and it is in teaching medical centers that such investments yield the greatest returns.

One of the most effective ways of teaching good medicine is by demonstration. To teach the diagnosis of disease and the care of patients a faculty member must diagnose disease and care for patients. This is also essential to the faculty person's own professional stature and development. Patients, hospitals, clinics, and many public and private health agencies provide the facilities for teaching demonstrations, and each benefits in varying degrees from its association with the medical school programs. Medical service is a valuable by-product of medical education.

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For a medical school a minimal research program is the amount necessary to sustain and completely utilize the scientific knowledge, interests, and skills of its faculty to the extent that this does not interfere with teaching responsibilities. A minimal medical service program must give each full-time faculty physician an opportunity to use his professional skills effectively and to a satisfying degree, and to adequately demonstrate good medicine to his students.

Teaching, research, and service are so integrated that a faculty member may treat a patient, teach undergraduate students, interns, and residents, and produce research data, all at the same time.

### THE PROFESSOR

EDWARD A. LICHTER, M.D.\*

Being frequently required to define one's position in the academic hierarchy, one readily gains insight by analyzing the figure at the top who is usually the person who sets the tone and pace of activity within the organization. For our purposes this is the Professor of Medicine but could readily be the Professor of Anything. Since both Einstein and Parkinson were able to reduce the world's complexities to a few simple mathematical factors, I feel that I am not making a revolutionary revelation when I express the position of the chief as:

$$Pm = K \times CART (f) WT,$$

a harmless formula to be sure, but one whose factor analysis can both conceal and reveal.

The first term *Pm* simply enough represents *the professor*, a quiet, unpretentious, dignified, and very impressive first position.

The second term is the constant *K*. The ever present physical or biologic constant is in my opinion a true prerequisite expressed here as the confidence factor whose derivation is *I AM*. These terms are very demanding and exacting, allowing only minimal human or individualistic variation to modify the genetic innate characteristics of Intelligence, Ability, and Motivation. Not unexpectedly these terms have been the subjects of essay by men more literate than I, to whom I counsel the reader with haste. The third term which appropriately corresponds to the generalizing factor found in every proper definition, represents the summation of the areas in which he pulls his weight, the so-called four horses of medicine. More simply defined these are Clinician, Administrator, Researcher, and Teacher. These, too, have been extensively described separately elsewhere, and I shall not elaborate on them here.

For the term *WT* is reserved the position of the individualizing role in the definition of a good definition. And for our definition, rightly so, since here individual variability may run rampant, checked fortunately by the symbol (*f*) which not only keeps us in reality but in fact is directly related to the third term *CART*. That a man's personality individualizes him, so then let these factors of acquired personality traits be defined.

*W* is a complexity I shall call a Worry factor. This may be either ulcerogenic, vasculotensive, or migranoid in type, combinations always being permitted. This is not to be

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confused with finite concern, probably at the opposite end of the continuum, which will be represented by lower case *w*.

The *T* factor in all science represents time, and I shall adhere to that convention with the addition that the upper case *T* shall represent the degree of preoccupation with time—finger drumming, to and fro walking, representing minor degrees of this compulsion, with the extreme being those individuals who purposely choose to live under the whimsical control of the commuter train schedule, thereby providing a defenseless inanimate object upon which to vent their sphincter animosity. His antipode (*t*) is the frequently seen individual to whom the passage of time is immaterial, to whom a deadline made for today can easily be delayed until tomorrow.

By using the combinations of *WT* as applicable to each of the four horses in theoretically pure prototypes one can immediately begin to discern the obvious individual differences of each. The clinician would carry a heavy worry factor but frequently would transcend time barriers, hence *Wt*. On the other hand, the classical Teacher showing genuine concern would still have a low worry factor but unfortunately still finds himself tied to a tight time schedule, hence *wT*. The administrator is subject to both high worry and time titers, hence *WT*. Finally, the true Researcher who claims to operate on a true ethereal plane is beyond deep worry and usually trains himself to be patient for timed events, hence the notation *wt*.

The value of applying this formula soon becomes apparent as a prognostic tool. Some men try to keep their *WT* factors balanced and so try to ride all four horses equally. Others, less well able to balance their *WT* factors are required to associate with and delegate areas to individuals with opposite balance in order to make a harmonium. Not only will committees seeking new professor appointments be able to predict the most likely performance from among prospective candidates, but the truly introspective individual will be able to determine his prospects for advancement as well as the quality of his performance while in office.

In closing I must apologize to those individuals who find themselves now in the wrong appointment and so must resign in order to reestablish the accuracy of mathematical formulations.

## ABSTRACTS FROM THE WORLD OF MEDICAL EDUCATION

ANGELA SANCHEZ-BARBUDO, PH.D.  
Abstract Editor

**Consumer Interests.** D. A. K. BLACK.  
The Lancet, pp. 673-74 (March 28), 1959  
(London).

At Manchester University, one of the final examination tests gives the candidate a choice of one out of six essay questions, some of which call for the arrangement of familiar facts, while others are designed to open the door more widely to speculation. In the past, the general tendency shown by candidates has been to choose the first, more "straightforward" type of subject. In a recent examination, however, over a third of the candidates left aside such subjects as "cardiac infarction" or "steroid treatment" and preferred to discuss this question: "Some practical ways in which medical education should be improved." In this paper, the author (Professor of Medicine at the University of Manchester) outlines the views expressed on education at school, in the preclinical and clinical years and after qualification (making it clear, however, that he is not committing himself "to the proposition that medical education should be determined by what final-year students think of it"). Only a few students considered the problems of school education and later selection for medical school, demanding, with differing emphasis, a broad general education (including languages), and a firm grounding in science. Only three of the fourteen outstanding essays (which provide the basis for Professor Black's discussion) had comments—all critical—on the methods of selection. All except three discussed the courses in anatomy and physiology, generally also in a critical tone. The most com-

mon complaint was that principles were lost in a mass of detail, and it was suggested that dissection could largely be *demonstrated rather than performed* (thus shortening the preclinical course to 1 year). The lack of apparent application to clinical problems was emphasized by several students, and some concrete suggestions for improvement were made (for instance, that surface anatomy should be stressed in view of its later application). Most of the discussion, however, dealt with the clinical years. There were frequent suggestions that teaching and examinations in pathology, bacteriology, and pharmacology should be completed in an extended preclinical period in order to avoid distraction from ward work. The need for increased opportunities for residence in or near the hospital was also stressed by almost all the students, as well as the importance of the first clerkship in medicine and the need for a thorough training in physical examination at this stage. Another majority opinion on the content of the course was that much more time should be given to "general practice." On teaching methods, some criticism was voiced regarding lectures and lecturers, and it was suggested that attendance at all lectures should be voluntary. A minority felt that the staff was "inaccessible" and advocated a tutorial system. The two most "revolutionary" suggestions were that all examinations except the final should be replaced by tutor's reports; and that the medical course should be arranged by "systems" and not by subjects (this last one deriving probably from the "Cleveland Experiment"). Postgraduate training and the med-

ical education of the lay public were discussed in a few essays (one view—considered rather "impractical"—was that radio and television education should be under the jurisdiction of a medical committee, as should medical articles in newspapers, books, and magazines). In his own comments on the opinions expressed by this group of students, the author points out that the essays were written as a part of the final examinations, i.e., at a time when the writers were "fully exposed to the rigors of the present curriculum" and "before their spirits had been revived" by the actual practice of medicine. In his view, the emphasis given by most students to residence in hospital and to experience of general practice is a symptom of their strong desire to come to grips with "practical medicine."

#### Fundamental Problems in Hospital Planning.

THOMAS McKEOWN, M.D.  
The British Medical Journal (Supplement), pp. 122-24 (April 4), 1959.

Two fundamental questions in hospital planning are raised: (1) how to keep patients out of hospitals? and (2) how to provide for those who must be admitted? As to the first, there is little doubt that the services which reduce the number of admissions (domiciliary care, outpatient service, etc.) are hardly less important to the future of the hospitals than their internal organization. Their improvement rests to a considerable degree in the hands of hospital authorities, but a closer relationship between the hospital and the community it serves is needed. However, it is with the second question that the author is mainly concerned in this paper, since, as he points out, some of its most fundamental problems are still unsolved, in spite of much research and planning. Among these the following are emphasized: (1) *How to provide sufficient medical and nursing staff for mental and chronic sick hospitals?* (the failure to provide adequately for the mentally ill and the aged sick may be considered perhaps the most unsatisfactory aspect of medical services in the Western world). (2)

*How to avoid mixing patients with entirely different requirements within the same unit?* (3) *How to make hospitals flexible* (in construction, size, design, and site) so that they will not be quickly out of date? Although these three problems may appear very different at first sight, it is pointed out that they are attributable basically to the same circumstances, namely, the separation of hospitals for the mentally ill and chronic sick from the general hospitals, and the traditional concept of the hospital as a single building providing a full range of services for selected patients. The author believes that "by bringing all facets of hospital work to the same site; by designing and equipping multiple buildings according to the needs of the patients to be admitted; and by assigning a common medical and nursing staff to all classes of patients, a solution of some of the thorniest problems which confront hospital authorities would be in sight." It would thus be possible to raise the standard of care for the mentally ill and the aged sick to the level achieved in general hospitals; to avoid the mixing within the same unit of patients with entirely different needs; and to create a center readily adaptable to the changes in size and character of the hospital population.

#### Pediatric Outpatient Department.

Some Problems Requiring Further Study.  
BARBARA MARIA KORSCH, M.D.  
Pediatrics, Vol. 23, No. 1, pp. 162-65 (Jan.), 1959.

The author (clinical director, Pediatric Outpatient Dept. at N.Y. Hospital-Cornell Medical Center) is one of a group of pediatricians especially interested in the functions of an outpatient department, particularly in regard to the role of ambulatory care in pediatric education. This group is engaged in a series of informal discussions at the meetings of the American Pediatric Society and the Society for Pediatric Research. These have demonstrated the need for objective standards in outpatient care; formulation of essential principles of good teaching

in the outpatient department, and the possibilities for research in problems of ambulatory patient care. The present paper contains the author's formulation of some of the current problems in this field. It is pointed out that, although high standards of patient care, clinical research, and teaching in pediatric outpatient clinics—as in others—can and should be maintained, no good standards are readily available for even such basic needs as adequate space and budget allowances, laboratory facilities, complete ancillary services, etc. No one has yet adequately set down optimal or minimal *space requirements* for patient care, for treatments to be carried out, waiting areas, play space, etc. The *cost* of providing ambulatory care to children has not been properly studied, and little progress has been made toward developing a satisfactory *diagnostic index* for pediatric outpatients. Besides such general considerations, mostly of an administrative nature, some of the more challenging problems in child care are discussed, such as the *relationship of general to special clinics*; the question *whether it is possible to develop standards for ambulatory care of patients with special needs*, and *what extensions of the traditional outpatient organization* (such as home care, family care, etc.) *are required in order to teach the "total care" of the child patient*. Other topics of discussion are the improvement of understanding and techniques regarding the *psychologic aspects* of pediatric outpatient work; the development of patterns for *staffing outpatient departments*; the *research potential* in this area and *some ways to improve the teaching of doctors, nurses, students, and ancillary personnel*. Special attention is drawn to the need of further study concerning *work with parents* of sick and well children, and *child development*. A peripheral but interesting matter is also touched upon by the author, who points out that, as prepaid health insurance is being more widely accepted, coverage for ambulatory care and diagnostic studies in the pediatric outpatient department will have to receive more consideration.

**Provision of Medical Care. History. Sociology. Innovations.** GEORGE ROSEN, M.D., PH.D. *Public Health Reports*, Vol. 74, No. 3, pp. 199-209 (March), 1959.

Organizations designed to provide medical care through some form of *group practice* have developed slowly but steadily in the last three decades. Some have been organized by consumers (using the Rochdale principles of co-operation); others have been created by groups of physicians in non-insured practice, by labor unions, or community groups. Some of these organizations are associated with prepayment plans, such as the *Health Insurance Plan of Greater New York* and the *Kaiser Foundation Health Plan*. Recently, however, criticism has been voiced regarding the slow growth of such plans, and questions have been raised which have highlighted certain inadequacies and drawn attention to the need of solving a certain number of problems. In this paper an attempt is made by the author (Professor of Health Education at Columbia University and editor of the *American Journal of Public Health*) to establish a historical and sociological framework within which group medical practice must be seen if its problems are to be understood. It is pointed out that group medical practice as an innovation depends for acceptance or rejection on how those involved in it perceive it. If these perceptions conflict with the individual's behavior and ideas (derived from his class position), there is clearly a need for understanding and action. In the U.S. the movement for prepaid medical care (like the public health and welfare movements), although intended for the benefit of the lower class, was conceived and implemented mainly by middle-class people acutely aware of the economics of medical care and the social consequences of its lack. Future-oriented, these members of the middle class were prepared to forego present satisfaction in order to achieve future goals. Great value has been placed on health as a means to an end—social amelioration—and on the use of rationally calculated means to reach this goal.

Financing and administration have thus become the major concerns of the movement for increased and better medical care. However, the author observes, "just as the Sabbath is made for man, so medical care is financed and organized to provide service to people," who, whether one likes it or not, are not all alike and do not all share the same goals, values, and norms. The health education program of the Health Insurance Plan, for instance, is based on a recognition of this premise (cf. G. Rosen, *Health Education and Preventive Medicine—"New" Horizons in Medical Care. Am. J. Pub. Health*, 42: 687-93, 1952; and *idem*, *The Physician in Health Education. Health Ed. J.*, 16:70-75, 1958). It is only recently, however, that there has developed an explicit awareness of the central relevance of social science for the provision of medical care. From this point of view, the author discusses some important dimensions of this problem, such as medical ideology and practice; competition and survival; "heresies" in the financing and organization of medical care; and the ideological weapons with which they were opposed. He also analyzes the scale of values, set of attitudes, and way of thinking acquired by the physician by virtue of the process of socialization, and the development of a professional "self-image," social class, and therapy, etc. A long list of bibliographical references can be found at the end of this paper.

#### Research in a Home Care Program.

CHARLES PERROW. *American Journal of Public Health*, No. 1, pp. 34-44 (Jan.), 1959.

Although there are numerous accounts of outstanding home care programs and a considerable amount of valuable routine data (on diagnostic categories, days of service, administrative organization costs, etc.), little systematic research has been done in that area. Especially felt has been the lack of research on the effect of care programs upon patients and the investigation of special problems of care and rehabilitation at

home. Some attempts made in this direction which utilized experimental research techniques have been severely restricted by their choice of methodology: eligible patients were placed in a study group which received home care or in a control group which did not, and the differences in results were then measured. However, a large number of crucial variables involved—such as diagnosis, age, sex, severity of illness, motivation, family influences, and team attitudes—cannot reliably be controlled by this method. Descriptive studies, on the other hand, while admittedly lacking the reliability of carefully controlled experiments, permit a more intensive examination of the data at hand and do not require the elaborate mechanism of control groups. Using relatively few cases, they can give weight to, or correct, general and systematic impressions and disclose latent trends. They also are apt to give much information about results of care. In the present paper, the author (a former research associate of the San Francisco Home Care Program) offers a detailed report on such an investigation undertaken by that organization (partly as a result of the generous research budget included in an Office of Vocational Rehabilitation grant). Despite the small number of cases and the ambiguity of the variables, the research, he states, has had several important results which are summarized as follows: (1) it insures a healthy and continuous self-examination of the program; (2) it provides a resource for effectively presenting the program to the public; (3) it provides a means for comparative studies of different programs; and (4) furnishes a source of valuable information on an important—though partial—solution to the expanding problem of long-term illness. In his conclusions, the author points out that the efforts undertaken were meant in part to supply the program with information and to experiment with the kind of research that a home care program might sustain, and in this respect he believes they proved to be worth while. He also informs that, since this paper was submitted for publication, a small but important step in co-

ordinating research among programs has been taken: At a conference of representatives of home care programs recently held by the Public Health Service, the *Chronic Disease Program* offered to act as a clearing house for exchanging short reports, research methods, ideas and questions on research among all home care programs.

**The Responsibility of a University Administration for Health of Students and Faculty.** MORLEY B. BECKETT, M.D., and C. J. TUPPER, M.D. *American Journal of Public Health*, No. 1, pp. 70-75 (Jan.), 1959.

There is, in recent times, increasing recognition by university administrations of their responsibility for the health of students and faculty. Administrative responsibility for health improvement can be exercised in many ways: this paper discusses some of them. It is emphasized that health services are no exception to the axiom that "we get what we pay for." Each school, however, has a different problem, depending on the size of its student body, location, availability of a medical center, etc. Programs and acceptance of responsibility for student medical care actually vary from practically nothing to services including specialists and elaborate equipment. The Health Service at the University of Michigan (Dr. Beckett is its director, while Dr. Tupper is in charge of its Periodic Health Appraisal Program), because of the existence of a medical center and because of the large number of students living away from home, has found it feasible and necessary to provide a considerable degree of specialized service. In connection with the health service offered at the mentioned institution, problems of cost, student health insurance, hospitalization, and prevention of disease and accidents are discussed. The health services' role in educating the faculty on the value of preventive care and early diagnosis is emphasized. One way to exercise this role could be the provision for voluntary examination of faculty members in order to demonstrate the exist-

ence of otherwise unknown or unrecognized conditions which can be referred to a private physician for early treatment. Such a program, started through the University of Michigan's Health Service in the summer of 1956, is described in detail.

**Unterricht und Fortbildung in medizinischer Radiologie** (Student and Specialist Training in Medical Radiology). HANS R. SCHINZ. *Deutsche Medizinische Wochenschrift*, No. 8, pp. 375-78 (Feb. 20), 1959.

The author (Director of the Institute of Diagnostic Radiology and the Radio-Therapeutic Clinic of the Kantonsspital, Zurich) discusses the realm and tasks of today's radiology, its role within the medical curriculum, and the training of specialists. At the University of Zurich, a 2-hour lecture course on diagnostic radiology (taught by Prof. Schinz) is offered to medical students every year (one semester deals with radiology of the skeleton, the other with that of inner organs). In an introductory lecture the general principles as well as the peculiarities of x-ray production and pictures are explained. These lectures usually draw quite a crowd (American students seem especially eager to attend) in spite of the fact that attendance of only one semester is required. Supplementary weekly x-ray courses for groups of about fifteen students are conducted by teaching assistants. Radiotherapy is taught during two semesters in the form of a clinic (mostly concerned with cancer). Advanced students may also train during summer vacation at the Institute or the Radio-Therapeutic Clinic. What is the aim of this training in radiology? The point is stressed that it is not designed to train specialists. Students are not expected, for instance, to learn how to make x-ray pictures themselves (this is a task for the specialist), but they ought to know how to x-ray a patient, since in today's general practice a physician must do this frequently. They also must possess some knowledge of how to

read x-ray pictures and familiarize themselves with protective measures and safety rules. In the radiotherapy course, students have to learn first of all that cancer can be cured not only through the knife but also through rays, and that in many cases a combination of both is indicated. The importance of early awareness on the part of the patient and early diagnosis on that of the physician can be demonstrated by the discussion of especially impressive cases. Through therapy lectures, the student becomes acquainted with the different forms of cancer, their symptoms, and the best therapeutic possibilities for each kind. De-

tailed statistics of successful treatment are presented. Application of hormone and chemotherapy is also a subject of critical discussion. Prof. Schinz puts emphasis on the fact that his teaching experience has shown that medical students seem to have more difficulty with "quantitative" thinking (the arrangement of things in terms of magnitudes and numbers) than with "qualitative" thinking (recognition and identification). X-ray therapy and problems of dosage, however, he warns, require the capacity of quantitative-causal thinking, and therefore the morphologically oriented medical student will need adequate preparation.

## NEW BOOKS

KENNETH E. PENROD, M.D.  
Book Review Editor

### Abstracts

**A Textbook of Medicine.** Edited by RUSSELL L. CECIL and ROBERT F. LOEB. Associate Editors: ALEXANDER B. GUTMAN, WALSH McDERMOTT, and HAROLD G. WOLFF. 10th ed. Philadelphia: W. B. Saunders Co., 1959. 1665 pp. \$16.50.

The tenth edition of this well known textbook of Medicine is available either in a single volume or a two-volume form. The first volume of the two-volume set contains through page 773. The price of the two-volume set is \$20.50. As in earlier editions, it has been attempted, as far as possible, to incorporate discussions of pathologic physiology and disease mechanisms into the total discussion of disease. When this has not been feasible, sections on metabolic and physiological processes in health and disease have been placed in close proximity to the clinical description of the disease to which they are particularly relevant, because, in terms of biological processes, fragmentation of the discussion of disease is artificial. The tenth edition contains a total of 36 articles on subjects which have not been covered in previous editions. Despite the inclusion of this new material, there has been no sacrifice of clinical considerations. This has been achieved by utilizing a new and clearer type which makes possible an increase in the text without an increase in the number of pages. The total number of contributors to this edition has increased to 164.

**Topographical Anatomy of the Dog.** By O. CHARNOCK BRADLEY, revised by TOM GRAHAME. 6th ed. New York: The Macmillan Company, 1959. 319 pp., 132 illustrations. \$5.50.

This volume was originally intended to provide a systematic guide to the dissection of the dog and consequently was adopted by veterinary schools throughout Great Britain. In re-

sponse to requests from anatomists and scientists, the volume has to some extent been enlarged to provide the kind of dog anatomy needed by the non-veterinarian. Particular attention has been paid to the growth and use of radiographical methods, and a number of radiographic plates have been added. Also of great value will be the elaboration of the nervous system and, in particular, the autonomic system. The book retains its original characteristic of providing a comprehensive guide to the step-by-step dissection of the dog, but in addition gives a clear, concise description of the morphology and topography of all the organs of the body.

**An Introduction to Electronics for Physiological Workers.** By I. C. WHITFIELD. 2nd ed. New York: St Martin's Press, 1959. 257 pp. \$3.75.

Since the first edition of this book was written, in 1953, the most striking development in the field has been the emergence of the transistor and other semi-conductor devices from laboratory curiosities to large-scale production and use. Accordingly, much of this book has been devoted to biological application of transistorized instruments for telemetering, implantation, etc. The author has given quantitative treatment, together with examples, wherever possible. The book should appeal to a wide variety of research workers who daily come in contact with electronic equipment.

**Orthopaedics-Principles and Their Application.** By SAMUEL L. TUREK. Philadelphia: J. B. Lippincott Co., 1959. 870 pp., 600 illustrations. \$22.50.

This book was born of a desire to compile scientifically accurate information relating to orthopedic surgery and to formulate a method by which these facts are readily accessible. The scope of orthopedic surgery is now quite wide, and a sincere effort has been made to integrate

the basic sciences with clinical material, giving a complete background in the relevant basic sciences plus an all-inclusive presentation of disease conditions, their diagnosis and treatment. The study of gross anatomy, histology, pathology, and physiology is fundamental to the armamentarium of the orthopedic surgeon. In addition, he must comprehend architectural and engineering principles. He must labor incessantly to improve and perfect surgical techniques. All these points of view are presented in this book. Dr. Turek has attempted to give a thorough description of general orthopedic conditions such as osteoporosis, metabolic bone diseases, and orthopedic neurology. This book is intended to be a textbook of value to medical students and a book of reference for the experienced surgeon.

**Anatomy of the Human Body.** By R. B. LOCKHART, G. F. HAMILTON, and F. W. FYFE. Philadelphia: J. B. Lippincott Co., 1959. 674 pp. \$13.50.

To lighten the burden of the student of anatomy is the purpose of this book. The intention of the authors that the words of standard texts might be reduced by half, yet remain fully instructive, is achieved for the most part by brevity, by avoiding a large measure of repetition, by eliminating such obvious statements as "the skin covers the body" and by other modifications. Words are in many places less than half and illustrations more than twice the number in standard texts. Whenever it facilitates the study, the unconventional is adopted. Function and the clinical applications of anatomy are stressed throughout immediately as they occur and are not segregated at the end of the section. This volume does not treat of embryology, although it contains sufficient histology to enable the student to appreciate function and bridge the gap between the naked eye and microscopic structure. The methods adopted appeal to the medical student beginning anatomy and also to senior students reviewing the subject in the final year of the medical curriculum. Also, many clinicians have expressed a lively interest in the novel and brief commentary method employed for the peripheral nerves. The arrangement of the text, the emphasis upon function, and the numerous illustrations, some 950 in a book of less than 700 pages, are also designed to appeal to the students of physical education, physiotherapy, radiography, and dentistry. In a word,

this book is built on the premise that "a little picture is worth a million words."

**Strong and Elwyn's Human Neuroanatomy.** By RAYMOND C. TRUEX. 4th ed. Baltimore: The Williams and Wilkins Co., 1959. 467 pp. \$10.00.

Much of the text material in the third edition remains. Major changes have been incorporated in chapters 1 and 13, while minor revisions have been made in each of the other chapters. Under the assumption that the student must acquire an appreciation of the growth aspects of the brain and spinal cord, as well as a knowledge of their blood supply, early in the course of study, such information has been assembled in two new chapters. The rhinencephalon and olfactory pathways have been elevated to chapter status. Alterations were dictated largely by student use and comprehension of the text. A conscientious effort has been made throughout this revision to maintain Professor Elwyn's original objective to keep this volume a "student textbook." Thirty-seven new illustrations have been added in the interest of clarity.

**Pathologic Physiology of Oral Disease.** By RICHARD W. TIECKE, ORION H. STUTEVILLE, and JOSEPH C. CALANDRA. St. Louis: The C. V. Mosby Co., 1959. 468 pp., 637 illustrations. \$11.50.

Correlation of the two important phases of clinical and microscopic pathology of oral diseases was the guiding theme in the preparation of this book for the dental and medical profession. To accomplish this aim, each condition is discussed from the clinician's, as well as the pathologist's, point of view. Particular care has been taken in presenting the clinical signs and symptoms of disease, especially in those systemic conditions presenting oral symptoms. The most commonly observed lesions of the oral cavity, primary and secondary and those related to systemic disturbances, are discussed in detail, and many of the less common lesions are also included; but the chapters on dental caries, anomalies of the teeth, pulp pathology, and pathology of periodontal disease are short in relation to the size of the subject, and only the most important features are included. The general pattern of consideration of the subject matter is the same in that etiology, clinical signs and symptoms, microscopic appearance, and treatment are included for the various conditions.

Illustrations were included whenever they were available, and it appeared that their use would lead to a better understanding of the entity under discussion.

#### **The Practical Evaluation of Surgical Heart Disease.** By ROBERT G. TROUT and ROBERT P. GLOVER. New York: McGraw-Hill Book Co., Inc., 1959. 116 pp. \$10.00.

This manual has been prepared primarily as an uncomplicated and ready reference to help the busy doctor appreciate the rapid advancements of the past decade in the pathology and surgical intervention in cardiovascular disease in man. This treatise is by no means an attempt to cover exhaustively the vast and complex subject of diagnostic cardiology. On the contrary, it is a rather drastic simplification of this subject, relying purely on fundamentals which have proved themselves by extensive clinical application. The total volume is divided into four distinct categories. The first is an introductory section relating to elementary physiology and anatomy as interpreted by the surgeon. These simplified concepts, intentionally unencumbered by detail as they relate to the heart and circulation in general, will enable the reader to understand more clearly the mechanics of the cardiovascular system. In the second, and main, division are presented the various clinical conditions for which surgery can presently be performed with effectiveness, the diagnostic criteria of import, and a recapitulation of the results that can factually be expected in each. A typical case is used in each instance as an example, with three additional cases representing some of the various stages of the problem under discussion. The third section is prepared as a discussion of the more advanced diagnostic techniques employed in the major clinics at the present time. Diagrammatic explanations of cardiac catheterization, left and right, are portrayed, as are the techniques and typical examples of angiocardiography and its value. The fourth section is an extensive and comprehensive bibliography from readily available material for those interested in studying one or more of the problems in greater detail. A 45-rpm record of selected typical heart sounds is included with the book.

**The Functions of the Endocrine Glands.** By PETER F. HALL. Philadelphia: The W. B. Saunders Co., 1959. 280 pp. \$5.75.

This book is written for those primarily interested in physiology, and, while the knowledge gained from clinical endocrinology is freely used, lengthy descriptions of disease have been omitted. Although the book is intended for graduates as well as undergraduates, the language of clinical medicine has been largely suppressed, so that those who are unfamiliar with terminology of disease will not find themselves at a loss. It has not been the aim of the author to achieve an absolutely up-to-the-minute book, but rather to present the facts and theories which are at present engaging the attention of those who are especially interested in the function of endocrine glands. Throughout the book are many evidences of our incomplete understanding of the subject today, and limits of present-day knowledge are emphasized. No effort has been made to compile a complete bibliography, but many references are listed, and at the end of almost every chapter an outstanding monograph or book giving full references to the literature of that subject is presented. An introductory chapter dealing with elementary organic chemistry has been included to permit better understanding of the chemistry of endocrinology. This chapter is self-contained, and the continuity of the book is not lost for those who choose to omit it. In addition, a chapter has been included dealing with the interrelationship between the central nervous system and the endocrine glands.

**Five Hundred One Questions and Answers in Anatomy.** By STANLEY B. MIROYIANNIS. New York: Vantage Press, 1959. 326 pp. \$5.00.

The contents of this reference text have been prepared to aid medical, osteopathic, and dental students, podiatrists, chiropractors, embalmers, optometrists, nurses, and others in their preparation for State Board licensure examinations, be it in the basic sciences, the practice boards, or for certification in specialties. This text is written for the most part in the interest of students in gross human anatomy. It is merely a guide giving adequate knowledge of the subject without being burdened with details and lengthy descriptions. Controversies on various answers have been left entirely to the student, in the hope that they may encourage further study in the subject, and only an account of the generally accepted facts is given. The questions and answers have not been classified according to

conventional texts of systematic anatomy. No illustrations are included, as it is felt that students should use this text only in conjunction with a standard anatomical text. Following the 501 questions and answers, which occupy 256 pages, is found an appendix consisting of 1,012 additional questions without answers, grouped under Gross Human Anatomy, Human Neuro-Anatomy, and Human Histology, for practice. Nearly all these questions are of the true-false, multiple choice, or completion type.

**The Challenge of Science Education.** Edited by JOSEPH S. ROUCEK. New York: Philosophical Library, 1959. 481 pp. \$10.00.

Today, science (and technology) is everyone's concern, not only Americans but all human beings in all corners of the globe. To Americans, this concern implies that a greater pool of scientifically minded citizens and of scientists is needed to enable the free world to regain and then maintain a position of scientific superiority in the cold war era. To this end, this book has been written, on the assumption that a survey of what has been done and what can be done is one of the most reliable "scientific" approaches. The present volume is a systematic effort to synthesize the cross-currents of thinking and the evaluation of educational practices in the field of science by some 32 distinguished specialists in this field. A definite effort has been made to cover the tested past experiences and to indicate what other possibilities, and even the necessary needs, to strengthen the role of scientific education in order to discharge the challenge presented to it by the threat of world crisis and international tension, in which science plays such a dominant role. The book is designed for the general reader as well as the specialist; the work deals with certain sociological, religious and political implications, as well as with the formal aspects of education from the pre-primary through the high school, college and university levels.

**Modern Dermatologic Therapy.** Edited by THOMAS H. STERNBERG and VICTOR B. NEWCOMER. New York: McGraw-Hill Book Company, Inc., 1959. 510 pp. \$10.00.

This is the second volume published under an agreement between McGraw-Hill and The Division of Post Graduate Medical Education, University of California Medical Center, Los Angeles. In this volume 22 collaborators present a

direct, clinical evaluation of contemporary advances in laboratory research in dermatology. The book is devoted to those conditions in which therapeutic changes have occurred within the last few years, and to such a degree that a review of the subject seems warranted and most needed. In the 26 chapters, management of common dermatologic diseases is given in detail, with specific therapeutic suggestions being outlined, making the book an aid to both the dermatologist and the general practitioner. Several chapters present in detail the most up-to-date treatment of the less commonly encountered but most serious problems such as the collagen diseases and deep fungus infections. Three chapters are devoted to current thinking on the role which the physician can gainfully use in the therapy of patients with psychiatric aspects of dermatologic disorders. A good basic discussion of internal medicine is applied to each disease under consideration.

**Patient Care and Special Procedures in X-Ray Technology.** By CAROL HOCKING VENNES and JOHN C. WATSON. St. Louis: The C. V. Mosby Co., 1959. 195 pp.

This book is written as a textbook for x-ray technicians, which, first, defines the technician's role in the medical team; second, supplies specific information on patient care in many diverse situations; and, third, offers practical technical help for doing many special x-ray procedures. The material contained in this book will be valuable in technician training programs, will supply a reference on special procedures for the trained technician, and will be an aid to the nursing profession in better understanding the problem of x-ray technology as it relates to the patients in their care.

**On the Mysterious Leap from the Mind to the Body.** Edited by FELIX DEUTSCH, with 15 contributors. New York: International University Press, Inc., 1959. 253 pp. \$5.00.

This book is an outgrowth of a workshop study on the theory of conversion conducted in collaboration with the Boston Psychoanalytic Society. The title of the book—actually a quotation from Freud—indicates the riddles surrounding transformation of psychic impulses into physical phenomena as well as the dependence of mental phenomena on physiological processes. The papers and discussions included

in this volume scrutinize the formative stages of conversion; its relation to sensory experiences, simple formation, identification, and the aggressive drives; its manifestations and psychoses, homosexuality, and disturbances of the menstrual cycle; its role in determining choice of symptoms. These theoretical and clinical contributions, by focusing on an all-inclusive concept of conversion, clarify many intricate problems and open up new avenues in which further research is needed.

**The Essentials of Roentgen Interpretation.**

By LESTER W. PAUL and JOHN H. JUHL.  
New York: Paul B. Hoeber, Inc., 1959. 815  
pp., 1203 illustrations. \$25.00.

The principle aim of this book has been to organize and set down as concisely as possible the basic facts of roentgen interpretation. The book is designed to bridge the gap between the elementary text and the multiple-volume reference work and will serve equally well as a review source for the practicing physician and surgeon, for those taking postgraduate training in one of the specialties, and as a textbook for the undergraduate medical student. The authors have briefly discussed the roentgen anatomy of the various divisions of the body. The descriptions of disease processes are concise, with discussions of clinical and pathologic features limited to the information necessary to clarify the roentgen observations. All the common and most of the unusual conditions and diseases with positive roentgen findings are included. Roentgen differential diagnosis has been emphasized in the more common diseases. Methods of roentgen examination are described, particularly those dealing with the more complicated diagnostic procedures such as bronchography and myelography. The care of the patient before and after such investigations is noted, and the referring physician is given some idea of what the examination entails and the way in which it is conducted.

**Hypertensive Disease-Diagnosis and Treatment.** By SIBLEY W. HOOBLER. New York: Paul B. Hoeber, Inc., 1959. 310 pp. \$7.50.

Although the cause of essential hypertension is still a mystery, it is now possible to bring about effective reduction in the blood pressure level by appropriate treatment. The three primary factors in determining the survival of the patient with hypertension may be listed as (1) the height of the blood pressure, (2) the duration of its elevation, and (3) the vulnerability of the arterial system to the morbid processes. Successful treatment has a dimension of time as well as magnitude. This book is intended to bring to medical practitioners knowledge of the procedures in use for bringing the blood pressure temporarily under control and maintaining blood pressure reduction as well as assessing vascular vulnerability in the disease. All phases of patient management are included whether the treatment is given at home, at the office, or in the hospital. The first two sections of the book describe criteria for the recognition of secondary forms of hypertension and give recommendations for the treatment of those types susceptible to cure. The three sections that follow are devoted to the diagnosis and treatment of primary hypertension and its complications and include a thorough discussion of the principles underlying treatment. Specific treatment regimens designed to reduce the blood pressure are considered, giving the pharmacodynamics, advantages and disadvantages of particular therapeutic agents, as well as discussing operative procedures and other methods of treatment. The twelve appendices contain precise details of techniques for tests and for treatment, including the handling of hypertensive emergencies. This section was designed to be of maximum aid to the physician for quick reference. Specific instructions are given for choice of patient, drug dosage, contra-indications and side effects, and total patient management. Throughout the text of the book case histories have been incorporated to emphasize the clinical viewpoint.

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## NEWS FROM THE MEDICAL SCHOOLS

### Arkansas

JOE T. CLARK of Okolona, Ark., has been appointed Dean of Student Affairs at the Medical Center. Clark is a graduate of Henderson State Teachers College and was a Fulbright Scholar in 1951 when he attended the University of Manchester in England. He earned his Master's degree in Education from the University of Arkansas and is now completing his work for the Doctor's degree.

### Baylor

Dr. RAYMOND D. PRUITT, formerly of the Mayo Clinic, Rochester, Minn., assumed his new duties August 1, as professor and chairman of the department of medicine. While at the Mayo Foundation, Division of the Graduate School of the University of Minnesota, Dr. Pruitt was professor of medicine and chief of medicine for medical education. He has been a consulting physician at the Mayo Clinic since 1943. He is secretary of the American Board of Cardiovascular Disease and is associate editor of the medical journal *Circulation*.

### Boston

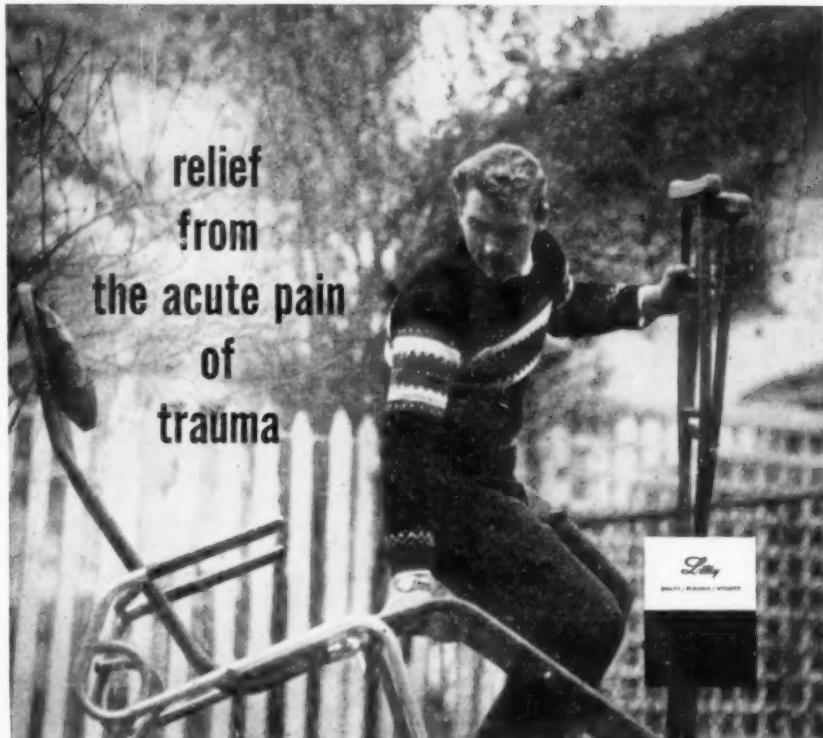
A plan to produce better physicians in less time through a unified six-year program of college and medical school education has been proposed by four Boston University professors after a two-year study of the problem. It will be put into effect when sufficient funds are collected to finance its operations, according to HAROLD C. CASE, president of the university. Drawn up by representatives of the faculties of the university's College of Liberal Arts and School of Medicine under a \$50,000 grant from the Rocke-

feller Foundation to the School of Medicine, purpose of the plan is manifold: the liberal arts and medical programs of study would be combined into a single integrated unit, extending over a six-year period; scientific background of the student would be improved by a more standardized method of medical teaching; and the arts and humanities will be stressed, thus strengthening the educational background of the medical student.

According to the so-called "Rockefeller Plan," the course would eliminate both the repetition of high school courses by colleges to compensate for the uneven quality of high school education and the preparatory versions of medical school courses taken by many pre-medical students. Because adequate preparation is assured, the medical courses can be taught at a faster pace but with less difficulty for the students, university officials said. Dr. LAMAR SOUTTER, associate dean and associate professor of surgery, represented the Medical School in drawing up the plan.

A campaign is being launched to raise \$600,000 among medical alumni for the Medical School Building Program as part of the university's medical development program, which consists of a research building, a classroom and teaching laboratory building, together with endowment for medical education. Now under construction is the university's \$3 million medical school research building, adjacent to the present School of Medicine and the Massachusetts Memorial and Boston City Hospitals. As the first step in the \$10 million long-range development program, this structure will provide facilities for basic and clinical research by faculty and graduate students. The pro-

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gram also includes \$3 million for the construction of a classroom and teaching laboratory building as well as \$4 million for endowment for medical education. The committee for fund raising will be headed by Dr. RONALD W. ADAMS, instructor in orthopedic and fracture surgery.

#### **Bowman Gray**

Dr. NORMAN M. SULKIN, professor of anatomy, has been named chairman of the department of anatomy, having served as acting chairman for the past year. Prior to joining the Bowman Gray faculty in 1952, Dr. Sulkin was associate professor of anatomy at St. Louis University School of Medicine.

#### **U. of Chicago**

Dr. DWIGHT E. CLARK, chairman of the department of surgery, died July 25, in Billings hospital, where he had been under treatment since May.

Dr. Clark became chairman of the department July 1, 1958, succeeding Dr. LESTER R. DRAGSTEDT. He was an intern instructor in the clinics of the University of Chicago from 1937 to 1944, when he became chief of surgery and commanding officer of the army hospital at Oak Ridge, Tenn., site of the government's atomic research installation. He returned to the university in 1947 as associate professor of surgery and became a professor in 1951. He was vice-president of the Society of Nuclear Medicine and a member of the board of governors of the American College of Surgeons.

#### **Cincinnati**

With the aid of \$545,000 from anonymous donors, the \$1.2 million Holmes Hospital improvements are now under way. An addition will be made to the hospital, a self-sustaining institution owned and conducted by the university, together with renovations in the original building in order to improve its efficiency. Current improvements include an increased bed capacity, two new operating rooms, six-bed recovery rooms,

doubling the size of X-ray facilities and tripling the size of clinical laboratories.

#### **Duke**

Dr. EWALD W. BUSSE, director of the Duke University Center for the Study of Aging, has been named to a key position in the organization for the 1961 White House Conference on Aging. Appointed by Secretary Arthur S. Fleming and Robert W. Kean, chairman of the National Advisory Committee for the White House Conference, Dr. Busse will head the Committee on Medical Research in Gerontology.

#### **Harvard**

A training program in clinical pharmacology and biostatistics related to diseases of the heart and blood vessels has been established at the Lemuel Shattuck Hospital in Boston and the Harvard Medical School under a grant from the National Heart Institute of NIH. The program includes a combination of on-the-job training in the planning and execution of therapeutic trials and formal instruction in research techniques related to clinical pharmacology. Both pre- and post-doctoral candidates will participate in the program. Dr. FRANK A. HOWARD of the clinical pharmacology division in the hospital and research associate in pharmacology at Harvard, will direct the program in collaboration with Dr. MINDEL C. SHEPS, assistant professor of preventive medicine and Dr. THOMAS C. CHALMER, chief of medical services at the hospital and clinical associate in medicine at the school.

Dr. THOMAS B. FITZPATRICK has been appointed Edward Wigglesworth professor of dermatology and head of the department. He will serve simultaneously as chief of the dermatological service at the Massachusetts General hospital.

Joining the ranks of professors emeriti . . . Dr. LELAND S. MCKITTRICK, clinical professor of surgery; Dr. JOE VINCENT MEIGS, clinical professor of gynecology; Dr. FRANCIS C. NEWTON, clinical professor of surgery;



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and Dr. LEROY A. SCHALL, who will become Walter A. LeCompte professor of otology and professor of laryngology, emeritus.

### Illinois

Dr. ORVILLE T. BAILEY, former professor of neuropathology at Indiana University School of Medicine and chief of that department at Larue D. Carter Memorial Hospital in Indianapolis, has been appointed professor of neurology at the College of Medicine. He succeeds Dr. Percival Bailey, who retired from the university September 1.

Since 1955 Dr. Bailey has been special consultant to the Public Health Service as a member of the neurology study section and since 1956, consultant to the Armed Forces Institute of Pathology. He is president-elect of the American Association of Neuropathologists and in this capacity has been invited to lecture before the British Association of Clinical Pathologists in September.

### Indiana

A former University of Illinois professor of biological chemistry has been named director of the university's new experimental program in medical education, to be inaugurated this month. In addition to his appointment as director, Dr. DOUGLAS A. MACFADYEN will become professor of pathology in the School of Medicine.

Aided by a pilot grant of \$173,000 from the Commonwealth Fund, the new program is a departure and extension of traditional medical training. It is designed to maintain a thorough training in polytechnical and cultural subjects, prepare medical students whose paramount interests are in research and teaching, and increase the number of broadly qualified physicians. Starting this Fall with a limit of 10 students selected from the approximately 180 to be admitted to the school, the program will draw on the resources of the College of Arts and Sciences and Graduate School, and will be administered by the Medical School under Dean John D. VanNuys. Eventually 30 students will be selected.

### Kentucky

Dr. JOSEPH B. PARKER, JR., has been appointed chairman of the department of psychiatry and professor of psychiatry. He was formerly associate professor of psychiatry at Duke University School of Medicine.

Dr. RICHARDSON K. NOBACK, assistant dean of the College of Medicine and associate professor of medicine, has been appointed director of the University Health Service.

### Marquette

Dr. JAY JACOBY, former professor and director of anesthesia at Ohio State University, has accepted an appointment at Marquette as professor and head of the division of anesthesiology. In addition, he will be a full-time anesthesiologist at the Milwaukee County Hospital. His duties will be concerned with establishing a training program in anesthesiology for medical students and residents at Milwaukee County Hospital. By July 1960, approximately eight residencies in anesthesia will be available. Dr. Jacoby will also aid in the expansion of the already existing anesthesia program at the Veterans Administration Hospital, Wood, Wisc., serving as a consultant in anesthesia.

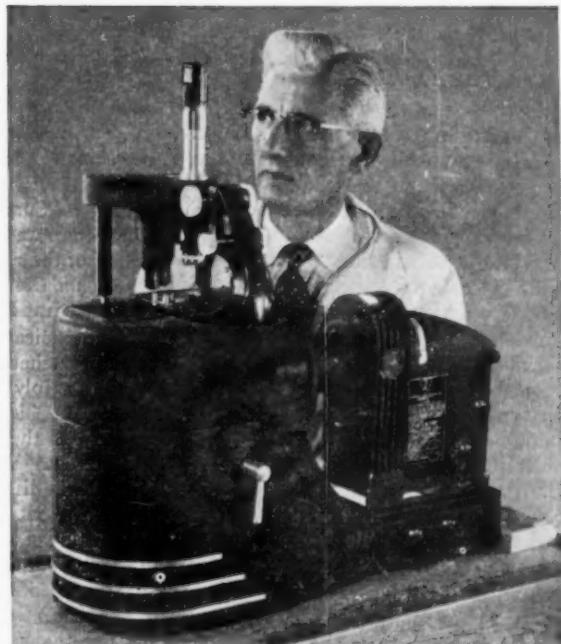
### Maryland

The Postgraduate Committee of the school of medicine will present the third annual 2-day course in Industrial Medicine and Occupational Health on Thursday, October 1 and 8, 1959. In addition to members of the faculty of Maryland's schools of medicine and law, lecturers and panelists will be drawn from Johns Hopkins School of Medicine and members of industry. The course is designed to be of interest to physicians, nurses, industrial hygienists, safety engineers, and plant personnel managers. Information may be obtained by writing to The Postgraduate Committee, University of Maryland School of Medicine, 522 W. Lombard St., Baltimore, Md.

Dr. JACOB E. FINESINGER, professor of psychiatry and head of the department, died

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June 19, after a year's illness. Dr. Finesinger joined the medical school faculty in 1950, having come from Harvard Medical School. The university's Psychiatric Institute, which he was to direct for its first seven years, was then being constructed. Educated at Johns Hopkins University, he spent some time studying psychoanalysis in Vienna and in Pavlov's Russian laboratory. During the war he did research on selection of aircraft pilots, served as port executive for the Port of Boston, as consultant in neuropsychiatry for the Public Health Service, and as a member of the medical advisory board of the Selective Service System. He was later consultant in psychiatry to the Veterans Administration and to the Surgeon General, U.S. Army, and a member of the Committee on Veterans' Medical Problems of the National Research Council. He was editor of the *Journal of Nervous and Mental Diseases*.

### Miami

The University of Miami School of Medicine, which has previously required a seven-year residence in Florida for admission to its classes, began admitting students August 6, if they have legal residence in the State. The law affecting the admission of students to the medical school was changed by the State Legislature at the recent session, according to Dr. HOMER F. MARSH, dean of the school. By the terms of the subsidy granted to the school by the State of Florida, 90 per cent of the student body must be residents of the State. Dr. Marsh explained that the definition of residence has been modified so that the medical school admission requirement is now the same as that for the universities operated by the State itself.

### Northwestern

Dr. LOYAL DAVIS, professor and chairman of the department of surgery, received an honorary fellowship in the Royal Academy College of Surgeons of Edinburgh, Scotland, July 23, at a convocation held during a meeting of the Canadian and British Medical associations in Edinburgh. In 1955,

Dr. Davis received the honorary fellowship of the Royal College of Surgeons of England, thus becoming the only professor of surgery at Northwestern to hold the honorary fellowships of both England and Scotland.

Dr. Davis is a regent of the American College of Surgeons and a past president of the American Surgical Association. He is editor of the surgical journal, *Surgery, Gynecology and Obstetrics*, and is chief of surgery at Passavant Memorial Hospital.

The medical school marked the launching of its Prosthetic Education program with a reception July 30, in the Rehabilitation Institute of Chicago. Operating on a training grant from the Department of Health, Education, and Welfare, courses in the new school will disseminate contemporary information about the prescription, fabrication and fitting of artificial limbs and braces and the rehabilitation of the orthopedically handicapped. Twenty-one courses lasting from one to three weeks each will be offered during the academic year to physicians, prosthetists, therapists, and rehabilitation counselors. Modelled after the (only other two schools in the country that offer prosthetic curricula, University of California and New York University) instructors and consultants will be drawn from the departments of orthopedic surgery, physical medicine, and the Prosthetic Research Center; from the Rehabilitation Institute of Chicago, from the University of Illinois College of Medicine, Loyola University's Stritch School of Medicine, and the Veterans Administration. There will also be qualified instructors from the prosthetic industry.

Directly responsible for the organization of the new program is its academic adviser, Dr. CLINTON L. COMPERE, associate professor in orthopedic surgery at Northwestern.

### Pennsylvania

The development of a new integrated teaching and research center for the basic biological sciences at the university, which will be closely associated both physically and intellectually with the School of Medi-

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cine, has been made possible by three grants totaling \$1,903,345. Grants of \$1 million from the Longwood Foundation, a philanthropic organization created by Pierre S. duPont, \$473,345 from the Public Health Service, and \$430,000 from the Rockefeller Foundation will bring into being a new building for research and teaching for the university's division of biology, directed by Dr. DAVID R. GODDARD, Gustave C. Kuemmerle Professor of Botany. Construction is scheduled to begin in September, with completion in the spring of 1960. According to university sources, educators and research investigators in both medical and biological sciences plan to make their facilities available to each other in all areas, welding even more closely faculty, investigator, and student into a uniquely, collaborative program of the life sciences, geographically and academically.

### Pittsburgh

Dr. RICHARD L. DAY, professor of pediatrics at the State University of New York College of Medicine, Brooklyn, has been appointed medical director of Children's Hospital of Pittsburgh, and chairman of the department of pediatrics. Dr. Day will come to Pittsburgh in early 1960, succeeding Dr. E. R. McCluskey, who resigned the two positions last year to become vice chancellor for Pitt's Schools of the Health Professions.

Dr. Day has been affiliated with the Vanderbilt Clinic and numerous New York City hospitals and has also served on the faculties of Columbia University and Cornell University.

### S.U.N.Y. Brooklyn

Dr. ROBERT A. MOORE, president of the Downstate Medical Center, announced the appointment of Dr. STANLEY L. LEE as associate professor of medicine. Dr. Lee is full-time director of hematology at Maimonides Hospital of Brooklyn, a teaching affiliate of the Downstate Medical Center.

Drs. JOHN J. KELLY, JR., and J. LEONARD BRANDT resigned August 31, as associate

professors of medicine to accept teaching and research positions in California and Canada. Dr. Kelly will become director of medical education at Mercy Hospital in San Diego, while Dr. Brandt has been named physician in chief of the Jewish General Hospital and director of medical research and lecturer in medicine at McGill University, both in Montreal.

Dr. J. HAMILTON CRAWFORD, clinical professor of medicine, retired from active service on the faculty and has been named clinical professor emeritus of medicine, effective September 1. Dr. Crawford will continue to practice medicine in Brooklyn, where he is attending physician at the Long Island College Hospital.

### S.U.N.Y. Syracuse

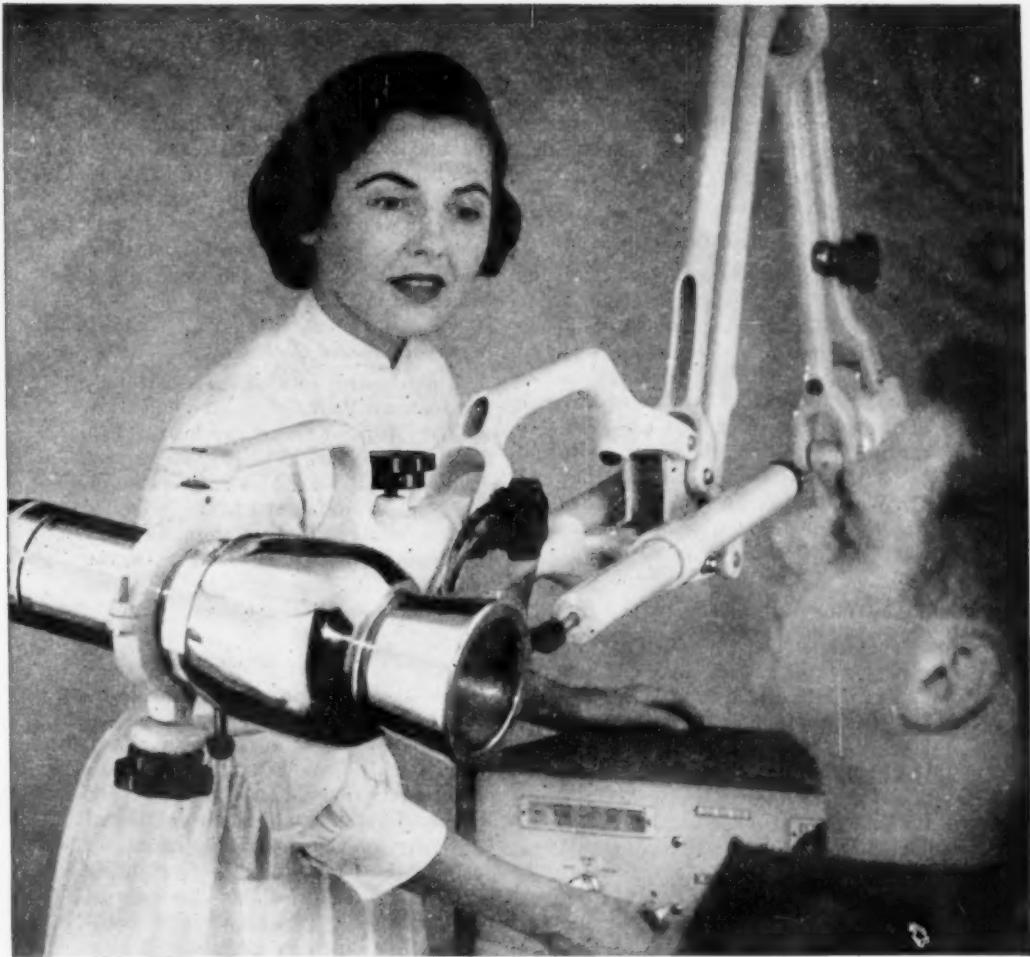
Dr. GORDON K. MOE, professor and chairman of the department of physiology, resigned his position at the Medical Center to become director of the medical research laboratory of the Masonic Foundation for Medical Research and Human Welfare. The laboratory is located in Utica, N.Y.

### Temple

The department of psychiatry is announcing a postgraduate course in psychosomatic medicine for non-psychiatric physicians beginning Monday, October 7. Sponsored by the National Institute of Mental Health, the course will be headed by Dr. O. SPURGEON ENGLISH, professor and head of the department of psychiatry; Dr. EDWARD WEISS, professor of clinical medicine; and Dr. H. KEITH FISCHER, associate professor of psychiatry. All inquiries should be addressed to Dr. Fischer, who is director of the course.

### Tennessee

A \$1.5 million three-story building providing expanded facilities for both radiological research and better treatment of patients will be the next addition to Memphis' Medical Center. According to preliminary plans, the new structure will connect to the Gaston Hospital and the out-patient clinic in the



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Gailor Hospital building. This will permit the addition of personnel to the staff, thus expanding the research program.

#### **U. of Texas Medical Branch**

Dr. ARILD E. HANSEN, professor and chairman of the department of pediatrics, and Dr. HILDA F. WIESE, professor of pediatric research, retired from the School of Medicine September 1. Dr. Hansen has accepted the position of Director of Research of the Bruce Lyon Memorial Research Laboratory, affiliated with the Children's Hospital of the East Bay, Oakland, Calif., and Dr. Wiese has accepted the position of Director of Laboratories at the same institution.

#### **Texas (Postgraduate)**

The school is announcing a course in cardiology at the Texas Medical Center December 7-11, with Dr. PAUL WOOD, director of the Institute of Cardiology, London, England, as its guest lecturer. Further information may be obtained by writing to the Office of the Dean, The University of Texas Postgraduate School of Medicine, 410 Jesse Jones Library Building, Texas Medical Center, Houston 25, Texas.

#### **Washington University**

Dr. PAUL E. LACY has been named assistant dean of the School of Medicine, succeeding Dr. JOHN C. HERWEG, who has held the administrative position since 1952. A member of the medical school staff since

1956, Dr. Lacy is assistant professor of pathology. He received the medical degree cum laude and the master of science degree in anatomy from Ohio State University in 1948. He was awarded the degree of Ph.D. in pathology from the Mayo Foundation of the Graduate School of the University of Minnesota in 1955.

#### **Western Reserve**

A new course entitled, "The Mentally Disabled and the Law" is being offered at the Law-Medicine Center starting this Fall. The 15-week course is designed for lawyers, doctors, social workers, law enforcement officers, public officials and others interested in the mentally ill. Further information may be obtained by writing to Dr. OLIVER SCHROEDER, JR., professor of law and director of the Law-Medicine Center.

#### **Yale**

Four new appointments were made recently to the faculty of the Yale School of Medicine. Coming from London, England, Dr. PAUL HOWARD-FLANDERS has been named associate professor of radiology. Dr. RUSSELL J. BARRNETT, formerly of Harvard University, will join the department of anatomy as associate professor. Dr. ROBERT A. CHASE, formerly of the University of Pittsburgh faculty, has been named assistant professor of surgery specializing in plastic surgery. Dr. JAMES F. GLENN will join the department of surgery as assistant professor, specializing in urology. He was formerly associated with Duke University Hospital.

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## ITEMS OF CURRENT INTEREST

### NIH Gets \$400 Million

Congress completed action on an annual appropriations bill which grants a record \$400 million to the National Institutes of Health; \$186.2 million for the Hill-Burton hospital expansion, and another \$30 million to subsidize building of research facilities by teaching institutions and hospitals. However, in a separate appropriations bill, the Senate has upheld the greater part of a House cut in funds sought by the Administration to develop civil defense programming in the Public Health Service.

### MEND News

Two MEND-sponsored symposia will be conducted this fall. The first, of particular interest to teachers of public health, preventive medicine, and related subjects, will survey U.S. Public Health Service operations, with special attention to their defense and disaster aspects. During the period October 12-16, participants will visit the Sanitary Engineering Center in Cleveland, Ohio, the Communicable Disease Center in Atlanta, Ga., Regional Office III in Charlottesville, Va., and PHS headquarters in Washington, D.C., making the entire trip by private train. The tour is arranged to end in Washington, for the convenience of those participants who wish to attend the annual meeting of the American Public Health Association in Atlantic City beginning October 19.

The second symposium on Blood, Fluids, and Trauma, will be conducted December 15-17 at Walter Reed Army Institute of Research, Washington, D.C. This symposium will deal with the management of traumatic cases and the prevention of shock by replacing lost fluids and maintaining fluid balance.

### Heart Association Seeks a Study Group

The American Heart Association has announced that it would seek the appointment of "an impartial group of physicians, scientists and community leaders" to study the problems arising from the increasing number of fund appeals by health agencies. Dr. Francis L. Chamberlain, president of the Association, said the intent of the proposed study would be "to create better understanding of the primary health needs of the nation, and at the same time to provide a yardstick for adequate and intelligent support of those health causes which are of greatest concern to the greatest number of people."

According to an approved resolution by the Association's Board of Directors, the proposed committee would define the major areas of chronic disease that threaten the nation's health and well-being, and set up standards by which potential contributors and volunteers could evaluate the health causes which seek their support.

The American Cancer Society has voted to "fully endorse" the American Heart Association's plan.

### Argentine Group Formed

The Argentine Society of Medical Education has been formed for the study of problems in medical education, with special and immediate emphasis on the establishment of postgraduate residency systems in federal, municipal and private hospitals; modernization of the hospital system; creation of specialty accreditation and recognition in the various medical fields, i.e., Argentine Boards of Internal Medicine, Boards of Surgery, etc., and collaboration with medical scientific and educational organizations with similar objectives.

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**Fellowships Granted by Pharmaceutical Association**

The Pharmaceutical Manufacturers Association has granted three fellowships in pharmacology amounting to \$21,000 for the purpose of training qualified individuals in the scientific techniques of clinical evaluation of drugs. The three recipients are: Dr. S. Craighead Alexander, who will be studying under Dr. C. J. Lambertsen, professor of pharmacology at the University of Pennsylvania School of Medicine; Dr. Robert Luchi, who will also be studying under Dr. Lambertsen; and Dr. Frederick Wolff, who is leaving the Wellcome Foundation in England for permanent residence in this country. He will be studying under Dr. Louis C. Lasagna, associate professor of medicine at Johns Hopkins University and Hospital.

The fellowship program is designed to aid the present shortage of men broadly trained in clinical pharmacology, and it is hoped that on completion of the training period, fellows in clinical pharmacology will choose

to continue academic careers and will find it possible to organize training programs in other medical schools.

**AMA Appoints Director for Publications**

Dr. John H. Talbott, professor of medicine at the University of Buffalo School of Medicine and head of the department at Buffalo General Hospital, has been appointed director of the American Medical Association's Division of Scientific Publications and editor of the *Journal of the American Medical Association*. The appointment was announced by Dr. F. J. L. Blasingame, AMA's executive vice-president.

Taking over his new duties October 20, Dr. Talbott succeeds Dr. Johnson F. Hammond, who has been on the AMA staff for the past 37 years. Dr. Hammond will continue on the *Journal* staff.

In addition to serving as editor of the *Journal*, Dr. Talbott will supervise editorial work of the AMA's ten specialty publications.

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**PSYCHIATRISTS:** Newly organized department of psychiatry in east coast medical school needs full-time psychiatrists for research and teaching. Rank and salary are dependent on experience and qualifications. Address: V-77.

**DIRECTOR OF MEDICAL EDUCATION:** for new 350-bed hospital. New position. Internal medicine specialist preferred for full-time position. Beginning salary about \$15,000 per year. Address inquiries to: Sister Administrator, Providence Hospital, Washington 17, D.C.

**PHARMACOLOGIST:** The University of Alberta invites applications for the position of Associate Professor of Pharmacology, effective not later than September 1, 1959, at a minimum salary of \$8,000 per annum, with annual increments. Duties include undergraduate and graduate teaching and a program of research. Applicants possessing a medical degree, in addition to qualifications in pharmacology, will be given preference. Applications should include a recent photograph or snapshot, a curriculum vitae, and the names of three references, and should be sent to the Dean of Medicine, University of Alberta, Edmonton, Alberta, Canada.

**PSYCHIATRIC SOCIAL WORKER:** Position open on new child psychiatry inpatient service to be opened on July 1. Research and teaching will be emphasized in developing program. Preferred qualifications are Ph.D. degree or doctoral candidate with solid clinical grounding in psychiatric social work. Master's degree in Social Work with 3 years psychiatric clinical experience will be considered. Position carries academic appointment. Send curriculum vitae with application. Address: V-78.

**PHARMACOLOGIST:** Full-time appointment in department of pharmacology for assistant professor of pharmacology. Ph.D. or M.D., preferably the latter, and previous training in pharmacology required. Salary \$7,000 or higher according to qualifications. Interested candidates should send a complete curriculum vitae and recent photograph to Dr. M. F. Murnaghan, Professor and

Head, Department of Pharmacology, University of Ottawa, Ottawa 2, Ontario, Canada.

**ASSISTANT IN PSYCHIATRY:** Research assistant wanted for psychosomatic project from July 1, 1959. Associated university affiliation. Salary according to qualifications up to \$5,700. Apply to Professor R. B. Sloane, Department of Psychiatry, Queen's University, Kingston, Ontario, Canada.

**ENDOCRINOLOGIST-BIOCHEMIST:** M.D. to become director of biochemistry laboratory at a 400-bed general hospital with medical school faculty appointment. Duties to include teaching; research will be encouraged. Large Eastern city. Address: V-79.

**PHYSIOLOGIST:** Full time appointment in physiology department of large medical school. M.D. or Ph.D. with training and research interests in cardiovascular physiology. Rank and salary (Instructor to Associate Professor, starting \$6400 to \$9000 plus, respectively) based on qualification and experience. Insurance, pension, travel allowance, relocation, other benefits. To assume post September 1. Address: V-80.

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**BIOCHEMIST:** Ph.D. Trained in protein chemistry, for research institute work on isolation of regulators concerned with the mechanism of hematopoiesis. Address inquiries to: Director, Toledo Hospital Institute of Medical Research, 2805 Oatis Avenue, Toledo 6, Ohio.

**PSYCHIATRIST:** Board certified or Board eligible, to act as a consultant to state mental health clinics, plan education programs for clinic personnel, to assist communities in organizing mental health clinics, to teach medical students and psychiatric residents concerning the field of community mental health, and to organize and participate in research on problems in community mental health. Interest in child psychiatry desirable. Position carries a professorial appointment in the medical school. Rank and salary according to qualifications. Address: Paul E. Huston, M.D., Chairman, Department of Psychiatry, College of Medicine, State University of Iowa, Iowa City, Iowa.

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To aid in solution of the problem of faculty vacancies, MEDICAL EDUCATION will list persons and positions available, as a free service. The school department or person may have the option of being identified in these columns or of being assigned a key number for each position listed. Mail addressed to key numbers will be forwarded to the person or department listing the request.

Information for these columns should reach the Personnel Exchange, Journal of Medical Education, 2530 Ridge Avenue, Evanston, Illinois, not later than the 10th of the month which precedes the month in which the listings will appear.

## Personnel Available

**THORACIC SURGEON:** M.D. 1947, University of Istanbul. Served an internship in surgery (1954-55) Montana Deaconess Hospital, Great Falls, Montana. Served as Fellow in Thoracic Surgery (sponsored by American College of Chest Physicians) Knoxville, Tenn. Presently in charge of thoracic surgery department at Armenian Hospital, Istanbul. Desires teaching position in American medical school. Address: A-391.

**PATHOLOGIST:** Age 35, married. Certified PA 1955. Academic background and three years teaching experience. Wishes to relocate in West. Will consider part-time or full-time teaching appointment. Especially interested in surgical pathology. Address: A-392.

**OTOLARYNGOLOGIST and HEAD and NECK SURGEON:** Age 32; board eligible. University of the Philippines graduate. Completed five and one half years' training in eastern medical centers (3 years otolaryngology, 6 months more bronchoesophagology, and 2 years general and head and neck surgery). Desires one year fellowship, or assistantship, or academic position. Available August or October, 1959. Address: A-393.

**BIOCHEMIST:** Ph.D., age 30. Assistant professor of biochemistry desires academic position. Five years medical and graduate teaching experience. Membership in national societies, honors, grants, graduate students. Fifteen full-length publications. Research interests: enzymology, microbial metabolism and protein metabolism. Available July 1, 1959. Address: A-394.

**PHYSIOLOGIST-PHARMACOLOGIST:** Ph.D., 1954. Male, married, with family. Presently teaching physiology in dental school. Desires teaching position with research opportunities in physiology or pharmacology department. Address: A-395.

**PATHOLOGIST-BACTERIOLOGIST:** M.S., B.S. (London University); M.R.C.S. (England) L.R.C.P. (London). Age 42; family; registered with British General Medical Council. Five years experience in general and clinical pathology and bacteriology, London, England. Completing 3-year contract in Jamaica. Desires academic appointment in U.S., preferably in the South. Available May, 1959. Address: A-397.

**VIROLOGIST-PATHOLOGIST:** Excellent experience and background in infectious diseases, human and animal viruses. Broad interests include cancer and pathogenesis. D.V.M.-Ph.D., age 34. Presently in industry. Desires research and teaching position. Would consider Senior Fellowship. Address: A-398.

**INTERNIST-HEMATOLOGIST:** Age 36, Board certified, with five years academic-type practice and previous research experience, seeks academic position in moderate sized city. Address: A-399.

**PSYCHIATRIST:** Female, age 26, completing final year of residency in June 1959. Training includes two years in an active university program and participation in family studies in schizophrenia. Analytically (Sullivanian) oriented. Special interests: Psychotherapy with schizophrenics, teaching professionals and non-professionals, liberal arts. Seeks position teaching in medical school with time for limited private practice. Interested in small university community. Address: A-400.

**PHARMACOLOGIST:** Ph.D., 1955; married, 3 children. Presently teaching pharmacology to medical students. Publications. Research interests: drug metabolism and toxicology. Desires teaching appointment in medical school that would provide opportunity for completion of courses leading to M.D. degree. Would continue teaching pharmacology after receiving the degree. Available August 1. Address: A-401.

**INTERNIST:** M.D. Age 33. Currently on faculty of eastern medical school. Experience in private practice and industrial medicine. Eight month experience and training in psychiatry. Desires faculty appointment with opportunity for clinical investigation in cardio-vascular diseases, as well as teaching general medicine, in teaching hospital. Address: A-402.

**VETERINARIAN:** Experienced in microbiological techniques; presently at a medical school. Desires position as director of experimental animal laboratory. Address: A-404.

**MICROBIOLOGIST-VIROLOGIST:** Ph.D., presently on university faculty. Five years experience in virology and tissue culture publications. Desires academic position involving full-time research or research and teaching. Address: A-405.

**ORTHOPAEDIC SURGEON:** 38. Wants appointment in U.S.A. or Canada. Main interest in Traumatic Surgery and Research. Now holding consultant post at well known British Hospital. Membership in Surgery and Fellow of the Royal College of Surgeons. Address: A-406.

**PSYCHIATRIST-NEUROPHYSIOLOGIST:** M.D. Certified in psychiatry and as a mental hospital administrator. FAPA and FSPA. No formal training in neurophysiology but using some of its principles with gratifying results in coping with the manifold problems of psychosomatic medicine. Desires full-time career teaching position in medical school with opportunities for teaching psychiatry; for learning clinical neurophysiology well enough to instruct; and for carrying on more intensive course of clinical investigation. Address: A-407.

**PHYSIOLOGIST:** Ph.D., 1957, age 31, married, one child. Research in cardiovascular-renal physiology. Strong background in hypertension. Eleven publications. Experience in teaching medical, dental, and pharmacy stu-

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To obtain membership, fill out the application form below, append check for \$10, and return to the Association's central office at 2530 Ridge Ave., Evanston, Ill.

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dents. Desires research position with or without teaching responsibilities. Address: A-408.

**MICROBIOLOGIST:** Ph.D., Sept., 1959. Training in all fields of basic microbiology, with research in microbial metabolism. Desires faculty position with teaching and research opportunities in a university or medical school. Address: A-409.

**PHYSIOLOGIST-ENDOCRINOLOGIST:** Ph.D., age 36. Training and background in endocrine, cellular, mammalian and zoological physiology. Presently assistant professor engaged in teaching and research in endocrinology and general physiology. Formerly research associate in biochemistry. Desires academic and/or research position. Address: A-410.

**ANATOMIST:** Age 34, married. Ph.D. Anatomy 1957. Publications. Teaching experience in Eastern medical school. Desires teaching position with opportunity for research. Address: A-411.

**INTERNIST:** Age 35, married. Ten years training in internal medicine and hematology. Teaching experience and research in field of clinical hematology, B<sub>12</sub> metabolism, radioactive uptakes, experimental hematology, and enzyme studies. Desires teaching position with opportunity for research. Address: A-412.

**SURGEON:** Age 35, native of Bombay, India. In U.S. since 1952. F.C.P.S. (Bombay), F.R.C.S.E. (Edinburgh). Completed residency training in general surgery in U.S. and successfully taken Part I examination of American Board of Surgery. Desires full-time position in teaching and/or research in American medical school. Presently senior resident in surgery in Eastern hospital. Experience in plastic surgery as well as urology and anesthesiology. Address: A-413.

**UROLOGIST:** University trained, finished 1956. Seeking full-time academic post: teaching, research, and clinical work. Presently in private practice and part-time university teaching. Address: A-414.

**GROSS ANATOMIST:** D.S.D., Ph.D. Ten years teaching experience in medical school; previously taught in dental school. Clinical experience in plastic and oral surgery. Research interests and publications: homotransplantation of tissues. Desires academic position in medical or dental school with research facilities. Will consider research associateship with plastic surgery department. Address: A-415.

**MICROBIOLOGIST:** Ph.D. Seeking position on medical school faculty in Southeast or Southwest. Many years experience and supervision in clinical microbiology. Six years on medical school faculty. Qualified in parasitology, virology and public health. Address: A-416.

**SURGEON:** Age 33. Certified in surgery and thoracic surgery. University trained with research background. Presently holding part-time university teaching appointment. Desires full-time academic appointment in surgery, preferably with additional duties as assistant dean working with curriculum and postgraduate training program. Address: A-418.

**INTERNIST-GASTROENTEROLOGIST:** Age 42. Board certified in internal medicine and in gastroenterology. Training and experience include 4 years as Mayo Foundation Fellow, full-time instructor in gastroenterology in leading university, clinical investigation and private practice. Trained in all gastroenterological techniques and bone marrow interpretation. Qualified in hematology, peripheral vascular diseases and rheumatology. Desires academic position in internal medicine, gastroenterology, comprehensive medical care section, as Assistant Dean, or as Director of Medical Education in teaching hospital. Address: A-419.

**MICROBIOLOGIST-CLINICAL PATHOLOGIST:** M.D., Ph.D., age 54, married. Wide experience in teaching and research in the United States. Returning after several years of teaching in medical schools in the Far and Middle East. Textbook in course of publication. Desires research or teaching position in medical school or in teaching hospital. Address: A-420.

**PATHOLOGIST-VIROLOGIST:** DVM, Ph.D. Experience in comparative pathology, virology and tissue culture techniques. Also considerable experience in teaching experimental pathology to medical students. Desires teaching appointment in a medical school that would provide opportunity for completion of courses leading to M.D. degree. Address: A-421.

**PSYCHIATRIST:** Board certified, with training in both general clinical psychiatry and public health psychiatry (M.P.H. degree). Six years' experience in administering a community-oriented psychiatric training program in an academic setting. Broad range of personal service in teaching, supervisory, and consultative capacities. Dynamic orientation. Numerous research publications. Age under 40. Currently assistant professor at medical school. Desires full-time faculty appointment at higher level. Address: A-422.

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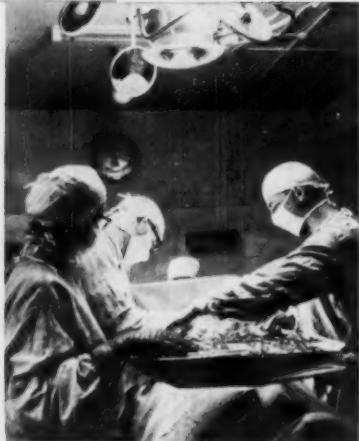
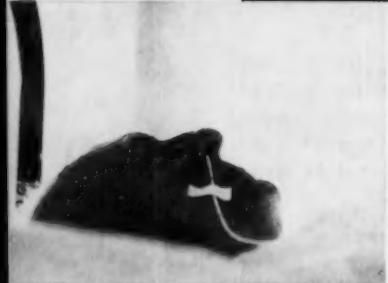
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